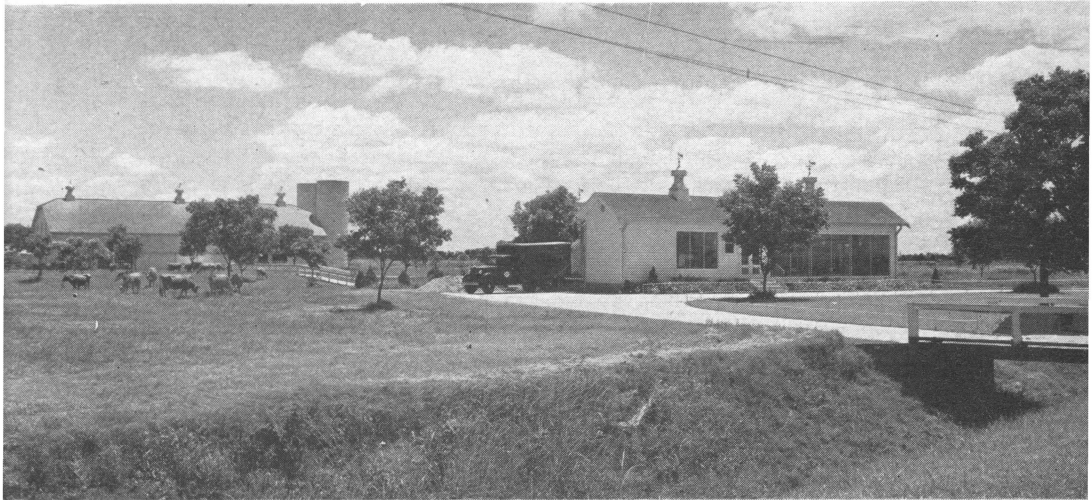


B-59

1947

Dairy Barn Plans



Issued by
The Extension Service
Agricultural and Mechanical College of Texas and
The United States Department of Agriculture
Ide P. Trotter, Director, College Station, Texas

DAIRY BARN PLANS

By

G. G. Gibson, Dairy Husbandman
M. R. Bentley, Agricultural Engineer
Texas A. and M. College Extension Service

Twice a day, every day of the year, the milking barn and other dairy equipment is in use. This means that careful thought should be given in planning the dairy barn layout so that all unnecessary work may be eliminated. The layout that serves the best interest of the dairyman and the herd makes possible the production of more high quality milk at a lower cost.

Careful planning in the beginning will be the means of saving many steps during the years that the barn is in use. Make sure that you have provided the most convenient means of bringing cows into the barn and turning them out. See that the feed room is of ample size for your needs, and conveniently located. Study the route that must be followed in carrying milk from the milking barn into the milk room. These are a few of the items that must be considered in planning for efficient use.

Before construction is started, make sure that the barn is going to meet all Health Department requirements. Consult local and state health authorities.

Maintenance of sanitary conditions in barn lots is much simpler when good drainage is provided. Natural slopes should be used to the best advantage. In flat country, it will be necessary to provide drainage through ditches that are kept open, and by grading lots. Paved walkways are a big help in maintaining clean barns during the milking operation.

The size of the dairy barn should be determined by the size of the milking herd. Most dairymen prefer not to have more than three turn-ins for one milking. More turn-ins than this mean more confusion and more time spent in bringing cows in and out of the barn. This does not apply to the walk-through type of milking barn, commonly known as the milking parlor. Figure No. 9 shows the arrangement of a 6-cow milking barn, shelter shed, milk house, and cow lots. Figure No. 8 shows plans for a shelter shed where hay and silage may be fed. Several floor plans for milking barns are shown.

Select Location With Care

Regardless of the kind of milking barn used, its location should be selected with care, if possible. The barn should be placed on a slight elevation of ground, to insure proper drainage of the yards. Dry lots are necessary for the production of clean milk. If good natural drainage is impossible to secure, it will be necessary to grade the lots and provide

drainage ditches to keep them dry. Figure No. 10 shows a good way of grading cow lots.

The milking barn should be located in the open and should not be closely surrounded by trees. Where trees are located too near the milking barn, sunshine is kept out, making it more difficult to keep the barn dry and in a sanitary condition. The milking barn should not be surrounded by cow lots. By having the lot a short distance away from the milking barn and with the cows coming to the barn on a paved walkway, exposure to dust and dirt from the barnyard will be kept at a minimum. A grass lawn around the barn will help materially in controlling dust and dirt.

Provide Light and Ventilation

There should be plenty of sunlight and ventilation in the milking barn. If a shed type barn is used, face the barn south. Cover the south side with one-inch mesh poultry wire to keep out birds and poultry. The north side and the ends should be solid wall to keep out the cold winds. However, the north wall should be provided with windows to help the circulation of air in the summer time. Where a closed barn is used, there should be plenty of windows. Allow a minimum of 3 square feet of glass for each stanchion. For the best circulation of air, the base of the window should not be more than three feet above the floor.

Floors for Milking Barns

Where cows are kept in the milking barn only while being milked, deep gutters are not needed and are undesirable. The type of floor most commonly used is one where a slope of about 2" is given from the stanchion line to the edge of the raised walkway. The walkway should be about 4" above the floor behind the cows. The walkway should be slightly sloped to drain toward the floor behind the cows.

A slope of about one inch for each ten feet of the whole barn floor length is desirable. If a deep gutter is used, it is satisfactory to make the floor level from end to end and to provide gutter drainage by sloping the bottom of the gutter. However, the entire barn floor may be sloped and the same depth of shallow gutter used throughout the length of the barn.

Concrete floors should not have a steel trowel finish since it is difficult for cows to stand or walk on smooth concrete where it is wet. A surface layer should be made of good rich concrete which will not soon wear into holes. This surface should be floated with a wooden float or finished by sweeping with a stiff broom.

Concrete Mangers Are Preferred

Mangers may be made of either concrete or wood but the former are preferable since dirty corners and crevices can be eliminated. Mangers may be made with divisions between cows but a single long manger is recommended because of ease in cleaning.

If at least 3½ feet of space is allowed each cow, there is very little trouble from any cow getting another's feed. The back of the manger should be at least three feet high to prevent the cow from throwing feed over it while eating.

Shed Barns Are Easily Constructed

The simplest and most easily constructed type of barn and one that will serve very satisfactorily on most dairy farms in South and East Texas, is the shed type. By making the shed 14 feet wide, there is plenty of room for manger, platform for cows, gutter and raised walkway.

The Texas Extension Service has plans for several types and sizes of dairy barns. If plans for milking barns are wanted, these can be secured through the county agricultural agents.

MILKING BARNs

Serial
Number

- 254—2 cows, 10' x 20' home dairy milking barn, feed room.
- 319—4 cows, one row, 14' x 35', including feed room and milk room.
- 218—6 cows, one row, milking barn, and feed rooms, 28' x 28'.
- 274—8 cows, one row, 16' x 32', with feed room, 16' x 16', milk room 12' x 16'.
- 323—8 cows, two row, 24' x 30', including feed room and milk room.
- 181—10 cows, one row, feed room, milk room, 32' x 51'.
- 272—10 cows, two row, 24' x 36', including feed room and milk room.
- 320—30 cows, two rows, milking barn, 24' x 59', milk room, 16' x 16', feed room, 16' x 16'.
- 130—31 cows, two row, feed room, milk room, 32' x 80', one story.
- 55—Milk house, 12' x 24', 3 rooms, concrete floor.

CATTLE FEEDING BARNs

- 288—Cattle feeding barn, 40 cattle, 24' x 72', 2 story, 2 bins, hay storage.
- 219—Cattle feeding barn, 40 cattle, 24' x 76', 2 story, 4 bins, hay storage.
- 226—Cattle feeding barn, 80 cattle, 34' x 100', 4 grain bins, 1 story.
- 57—Calf shed, 15 calves, 12' x 30', south side open.

HAY RACKS AND FEED BUNKS

- 5463—Hay or silage bunk. Stanchion-like type.
- 5464—Hay-feeding rack.
- 136—Hay-feeding rack. Less lumber needed than for No. 5464.
- 139—Forage or silage bunks.

SPECIFICATIONS FOR BUILDINGS FOR GRADE "A" MILK PRODUCTION

Although the following statements about structures for Grade "A" milk production are quoted in the main from publications of the Texas State Department of Health, they should not be construed as authoritative. We recommend that before starting any such construction work, you consult your dairy inspector or the State Department of Health, Austin, Texas.

Dairy Barns

The minimum width of the dairy barn should be 24 feet for two rows of stanchions and 14 feet for one row of stanchions. If feed alleys are used, a minimum width of 32 feet for two rows of stanchions, and 16 feet for one row of stanchions, is recommended. Allow a minimum of 500 cu. ft. of air space per cow. In narrow one-story barns, the omission of

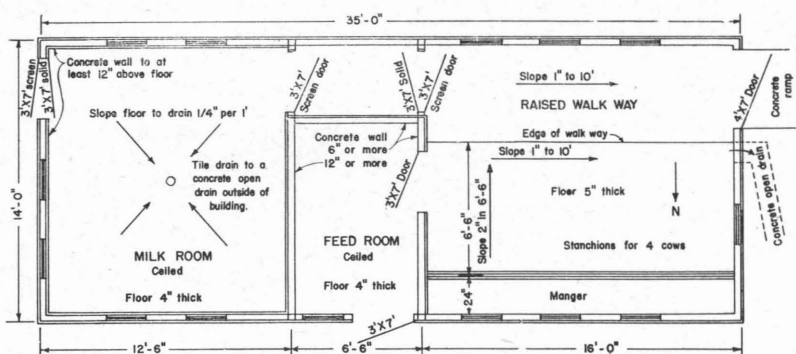
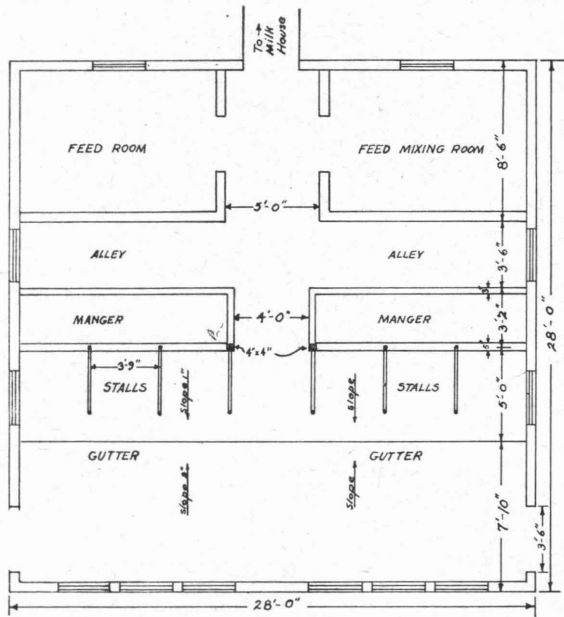


Fig. 2. Four-cow milking barn with feed room and milk room. Plan No. 319.

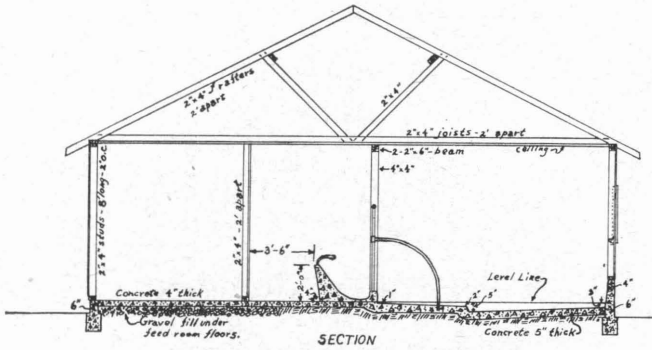
a ceiling may increase the air space to the required amount. The minimum wall height should be 8 feet from floor to plate. The roof should have a minimum pitch of 1 to 4. In loft type barns, the height of walls should not be less than 10 feet from the floor to the tight ceiling where feed stuff is stored above. Stanchion divisions should be on not less than 3'6" centers. The divisions should be 4' apart for Holstein cows.

Wooden mangers are permissible, if painted. If wooden mangers are used, avoid such construction as will furnish rat harbors.

The entire structure should be set on and bolted to a concrete curb of a height of not less than 6 inches and preferably 12 inches, to make sidewall lumber cut in even feet. The floor should be of concrete and the gutter type or the uniform slope to raised center walk type. The floor should be graded to drain 2 inches per 7 feet to gutter behind the cows. The longitudinal slope of the barn should be one inch per 10 feet. Gutters

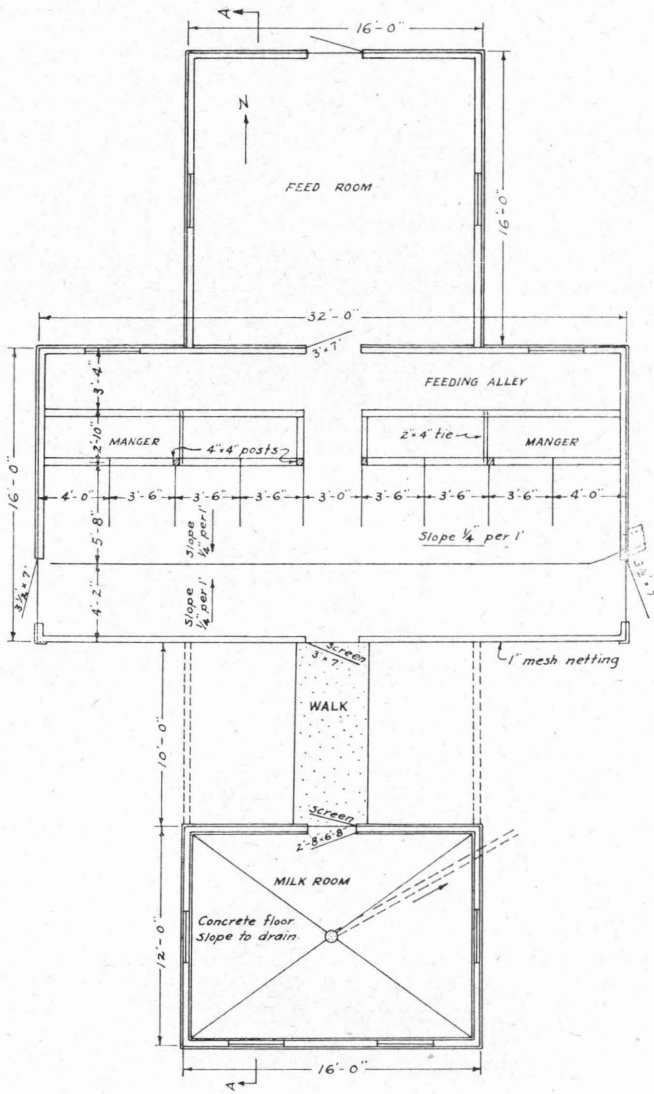


FLOOR PLAN OF MILKING BARN



SECTION

Fig. 3. The floor plan and a cross section of a six-cow milking barn are shown above. Plan No. 218.



This milk room for wholesale dairy. For retail dairy make two rooms with total floor space not less than 240 sq. ft. or 15'x16'.

Fig. 4. Eight-cow milking barn with feed room and milk house. Plan No. 274.

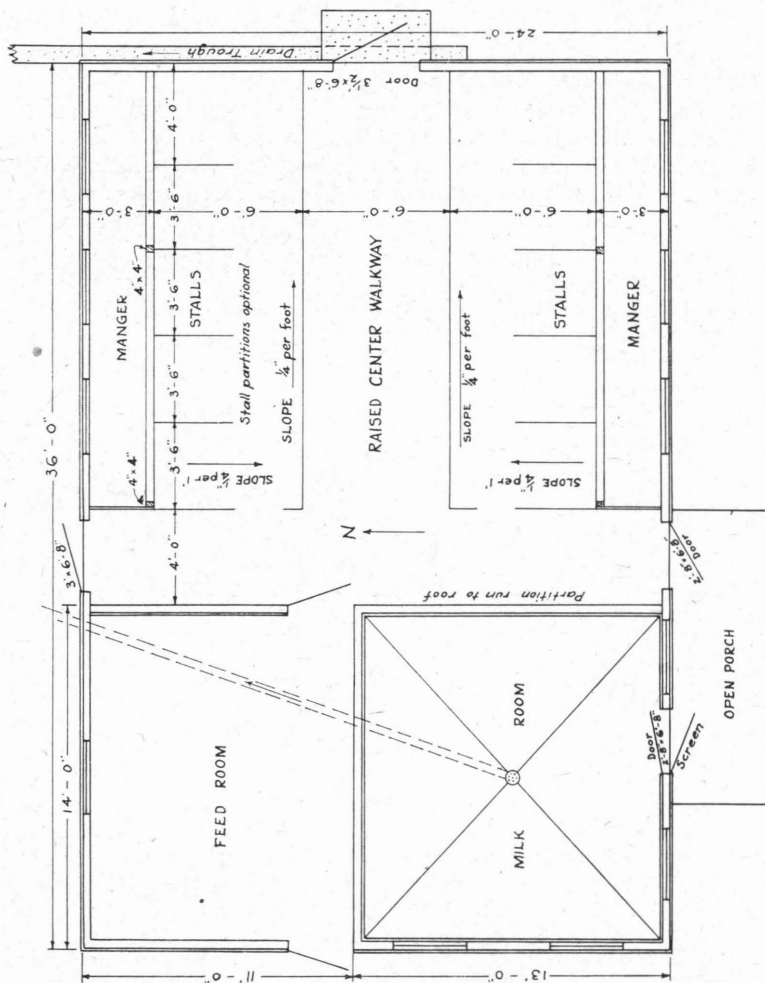
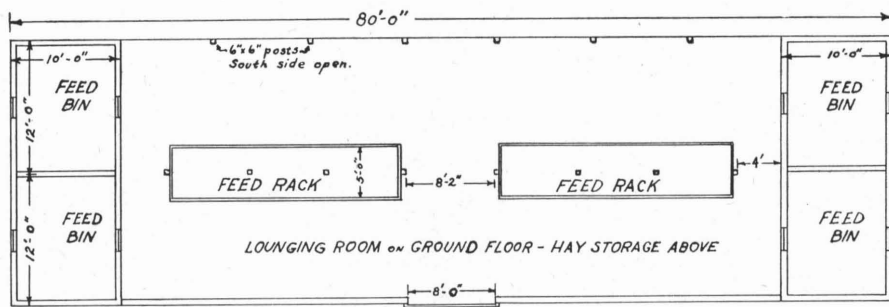
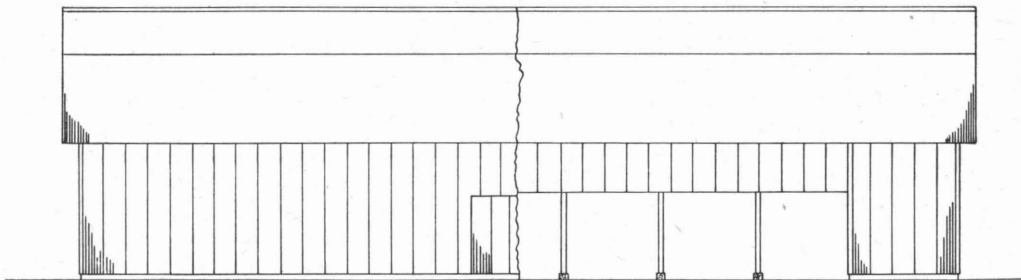


Fig. 6. Ten-cow milking barn combined with a milk room and feed room. Plan No. 272.



FLOOR PLAN OF HAY AND GRAIN STORAGE BARN AND LOUNGING BARN



SIDE ELEVATION OF HALF NORTH SIDE

SIDE ELEVATION OF HALF SOUTH SIDE

Fig. 8. The floor plan and side view of a feeding barn are shown above. Plan No. 219, or Plan No. 288. See list.

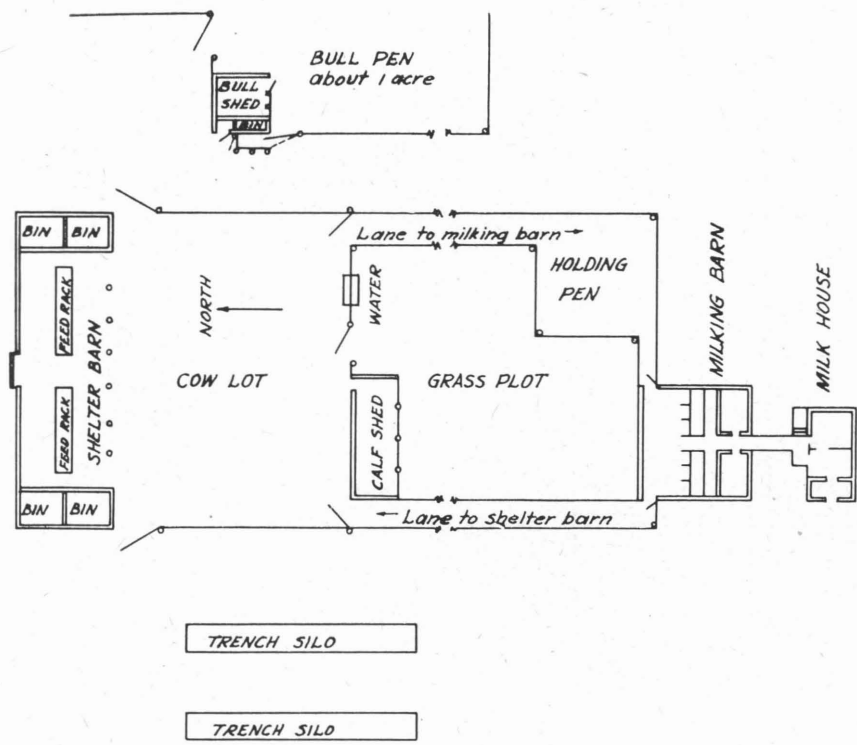
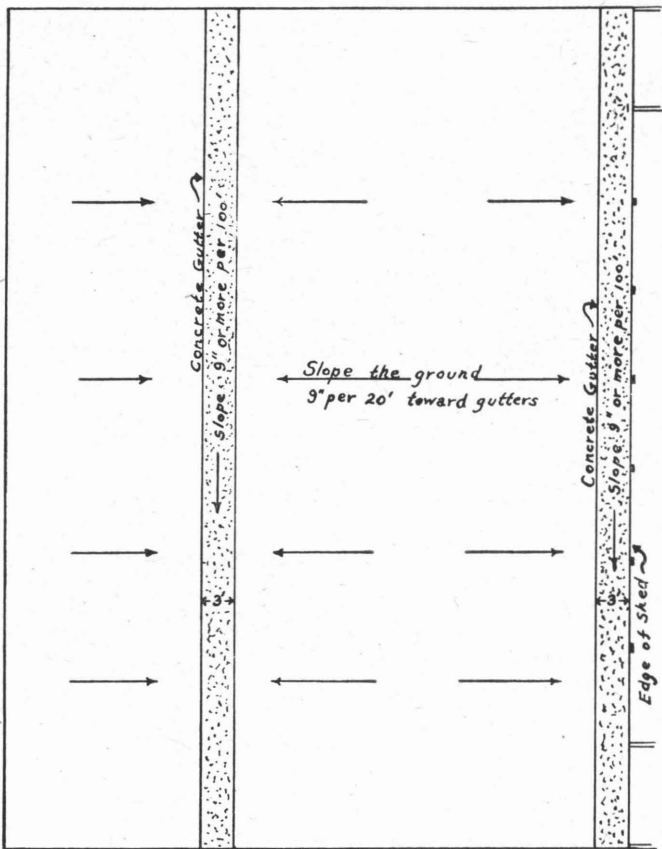
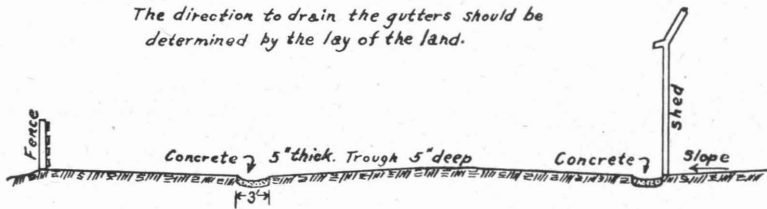


Fig. 9. The ground plan shown above is of a dairy layout which can be adapted to any size herd.



Plan of Lot Drainage.

The direction to drain the gutters should be determined by the lay of the land.



Cross Section of Lot.

Fig. 10. The above plan for draining barnyards in level sections is recommended.

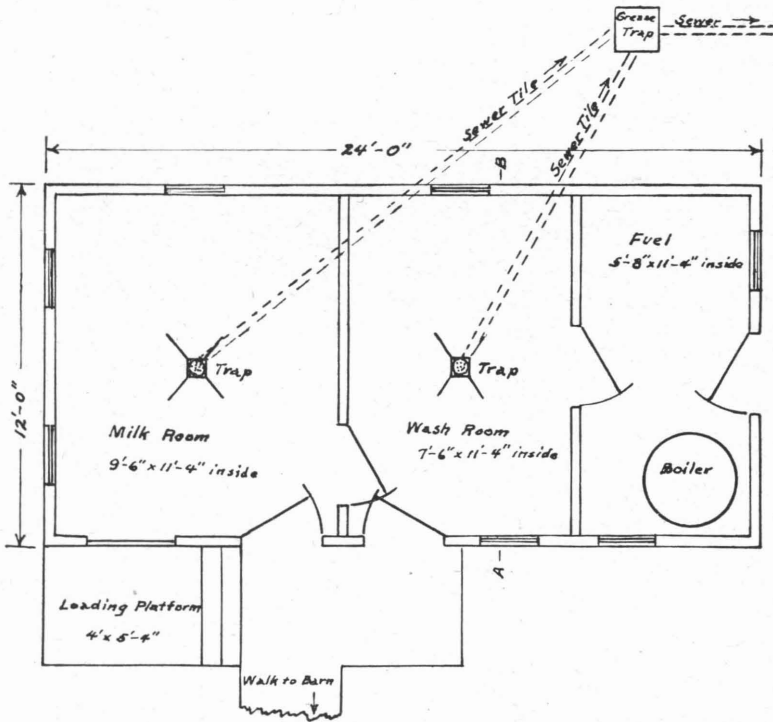


Fig. 11. Floor plan of a milk house. Plan No. 55.

For a retail dairy handling as much as 50 gallons daily, the two rooms should have a total floor area of at least 207 square feet. The house should be divided into two rooms with a fly-proof partition between them.

For information on other capacities consult the dairy inspector or the State Department of Health.

The milk room should rest on and be bolted to a concrete curb of a height of not less than 12 inches and should have a floor of concrete which should be smooth and graded to drain ($\frac{1}{4}$ to $\frac{1}{2}$ inch per foot). The trap drain should have a grate over the drain-opening with a four-inch minimum size for the drain line. The height of the wall should be not less than 8 feet from floor to ceiling. The walls should be of double type construction, the inside finish of which should be smooth and cleanable. If single wall construction is allowed on outside walls, the building should be adequately stripped on the outside and the interior of the milk room ceiled with tight fitted material. The milk room should be painted

on the inside with oil paint, preferably white. The milk room should not open directly into the milk barn or any other room such as a feed room, storage room or any room used for living quarters.

The milk room should have glass window space of not less than 10% of the floor area, exclusive of solid openings that can be closed, and all openings should be effectively screened against flies. Doors should be equipped with strong springs or weights so as to make them self-closing and should open to the outside. It is recommended that screen doors be covered with galvanized iron to a height of about three feet, in order to make them stronger and to minimize breakage and tearing of the screen.

Running water should be provided in the milk room and preferably in the barn with handwashing facilities near the passage way from the barn to the milk room.

The drainage from the milk house floor should be carried at least 20 feet from the milk house in a water-tight clay or concrete tile line, and should be carried at least 100 feet from the milk house and milking barn either in a tile line or a substantially built shallow open concrete drain. If the floor drain is to be connected with a sewer, septic tank or cesspool, the drain or drains should be of the trapped or water seal type to prevent sewage or odors from access to the milk house and the line should be vented.