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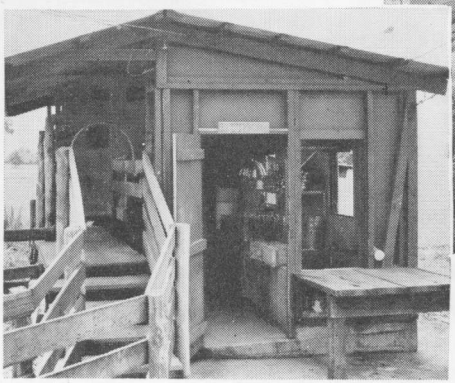

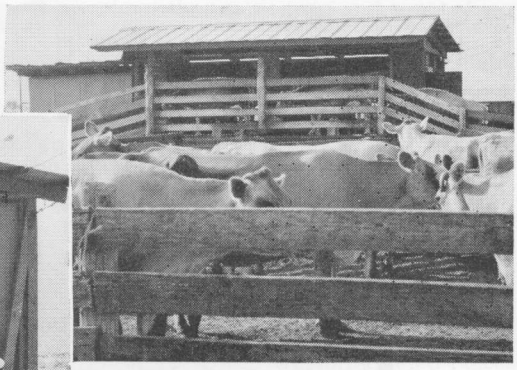

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LOW-COST MILKING BARN

for Manufacture-Grade Dairy

NOBODY WANTS TO MILK in a dark, dirty, uncomfortable shed or under a tree in the barn lot. But many dairymen producing manufacture-grade milk are still using such "facilities" because of high building costs and low milk prices. (The price for manufacture-grade milk in Alabama is about half that of milk sold for fluid uses.)

Returns do not justify construction of expensive milking barns. Therefore, building costs must be held to a minimum if manufacture-grade dairymen are to enjoy the comfort and convenience of modern milking barns.

A milking parlor that meets both labor saving and low cost requirements has been designed by the Agricultural Experiment Station of the Alabama Polytechnic Institute. Such a parlor has been built at the Black Belt Substation, Marion Junction (see title photo), and has proved satisfactory during about 3 years of use.

The unit is designed so that it can be built as a separate structure, Figure 1, or in the corner or side of a barn or

[1] Appreciation is expressed to B. F. Alvord and Willis W. Marshall, Jr., for their assistance in obtaining and analyzing time and motion data in connection with this study. Also, the cooperation of the late Wilbur Kelley, former superintendent of the Black Belt Substation, is acknowledged.

AGRICULTURAL EXPERIMENT STATION
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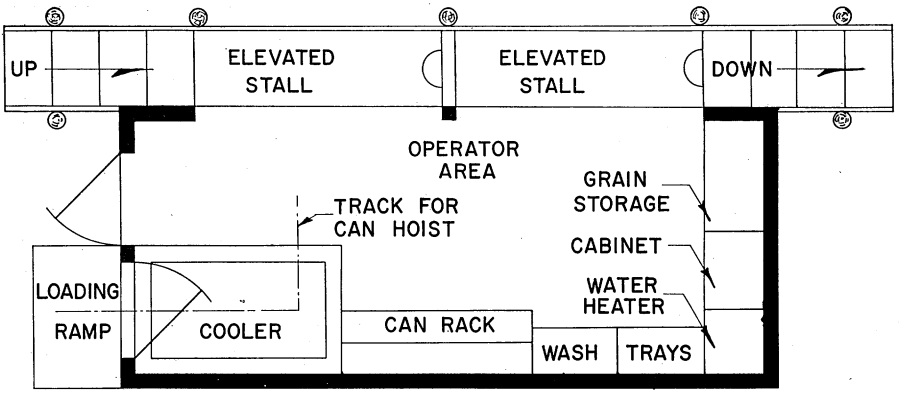

FIGURE 1. Shown above is the floor plan of the low-cost milking parlor built as a separate structure.

shed, Figure 2. Many dairymen have existing facilities that can be converted to a similar parlor with little expense. Neither a pit for the operator nor an excessively high ceiling is required since the stalls can be constructed on the outside and protected by a small overhanging roof.

DESCRIPTION

The milking area is small and compact, yet efficiently arranged. It has two elevated walk-through stalls, a milk cooling tank, can racks, water heater, wash vats, storage cabinet, feed storage space, can hoist, and a milk loading ramp, Figure 1.

The parlor is 11 × 20 feet, including the elevated stalls. The working area measures 8 × 20 feet. Side walls are built of treated lumber and covered on the inside with a durable, hard finish, moisture resistant building board. Framing members are exposed on the exterior. Work space and stalls are covered with a low pitch shed roof that provides ample protection for the working area and the elevated stalls.

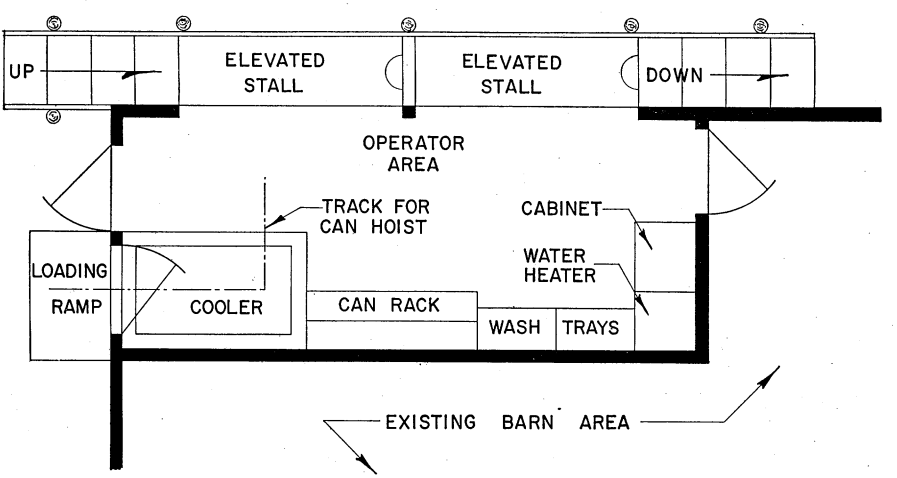

FIGURE 2. The unit is designed so that it can be built in the corner of an existing barn or shed to reduce building cost.

FIGURE 3. Elevated stalls make milking easier by eliminating stooping, bending, and squatting.

Since the entire work area is on one level, there are no steps for the operator to climb. The floor slopes into a gutter or drain under the stalls, assuring a well drained floor for safe footing.

The stalls are elevated 30 inches above the floor and permit milking without the usual stoop and squat, Figure 3.

The can into which milk is strained is only a few steps from the milking machines, Figure 4. When full, the can is lifted into the cooling vat with a hand operated can hoist. The same hoist is used in lifting full cans from the tank to loading ramp.

A small feed storage room is located near the stalls so that concentrates are fed with a minimum number of steps.

The elevated stalls, steps, and ramp are supported on pressure-treated poles. Steps and floor of the elevated stalls are framed with treated lumber and surfaced with a 4-inch slab of reinforced concrete, Figure 5. The walk-through stalls are constructed of treated lumber and provide a low-cost substitute for commercial stalls. If desired, the elevated ramp and steps can be built of concrete and masonry material.

The open front of the building faces south to take advantage of the winter sun and to protect the operator from cold north and west winds. For added

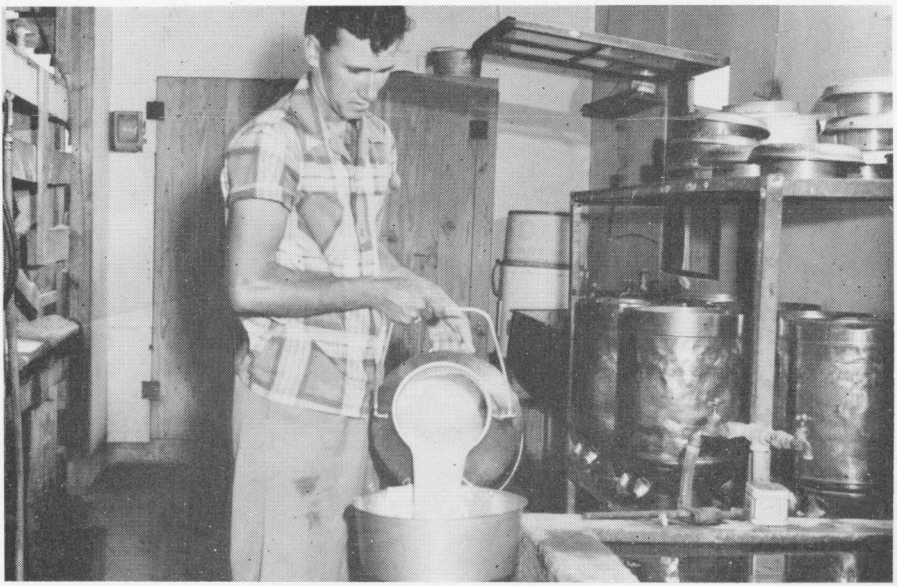

FIGURE 4. The strainer is only a few steps from the milking machine in the compact, efficiently-arranged barn.

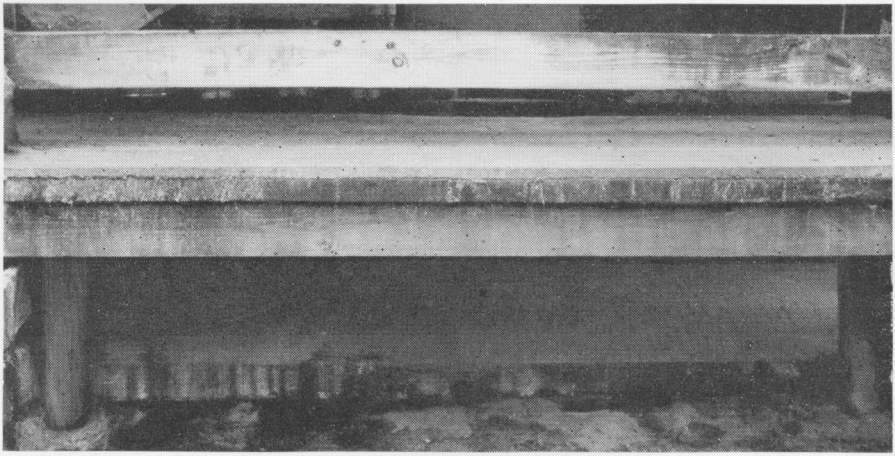

FIGURE 5. Steps and floor of elevated stalls are built of treated lumber surfaced with concrete and supported on pressure-treated fence posts.

comfort during cold days, two heat lamps can be directed toward the areas in which the operator spends most of his time.

COST of PARLOR

Material and labor costs for building a parlor by the Experiment Station plan is about $400 to $600 at 1957 prices. This expense can be reduced by a farmer supplying his own labor and by obtaining some of the material from an old building or the farm woodlot. Converting an existing building should be much cheaper than constructing a new one.

Approximate cost of building the parlor at the Black Belt Substation in the fall of 1954 were as follows:

Item	*Cost*
New materials	
Sheet metal, 4.2 squares	$ 35
Framing, asbestos board, and concrete	200
Treated posts	30
Estimated value of old framing materials used	35
Labor	
Skilled, 120 hours	120
Common, 180 hours	90
TOTAL	$510

In addition to the milking area, there is a hay shed used for the cows. Value of this building is approximately $650. Total investment in buildings is about $1,160 for a 28-cow herd – $41.43 per cow. Even for herds as small as 8 to 10 cows, it appears reasonable that this building investment would be justified.

LABOR EFFICIENCY

An 8-cow stanchion barn was used at the Black Belt Substation before the milking parlor was built. Detailed labor records on the milking operation were taken in the old stanchion barn and in the new parlor to compare and evaluate labor efficiency of each. Labor records on morning and afternoon milking on four dates were taken by two persons in both barns. In each case, trained personnel used stop watches in getting the time data. Each milker who worked in the new barn did the chores for several weeks before time records were taken.

During the time-study period, three different workers were involved (see table). This resulted from changes in hired operators on the dairy unit. Two single-unit milking machines were used in all cases, both in the stanchion barn and the elevated-stall parlor.

TIME USED PER COW PER MILKING IN THE STANCHION AND ELEVATED-STALL BARNS USING TWO SINGLE-UNIT MACHINES, BLACK BELT SUBSTATION, MARION JUNCTION, ALABAMA, 1954-55

Item	Stanchion barn		Elevated-stall barn	
	Man A	Man B	Man B	Man C
Cows milked, *number*	28	18	20	23
Time per cow per milking, *minutes*				
Total[1]	4.6	6.6	7.6	3.4
Idle man	.2	.4	.4	.6
Machine on cow	6.3	7.1	5.4	3.7
Clean up	1.0	1.7	1.5	.3
Idle machine time[2], *minutes*	.7	2.4	4.8	2.4
Man hours per cow per year	55	79	91	41

[1] Does not include time used in getting cows from pasture, feeding hay, or feeding and care of calves.

[2] Total minutes of all idle time from "off cow" to "on cow" divided by number of times idle.

Man C did the various chores with the least time per cow per milking. His time was less than that for the other two men, one of whom milked in both barns, and one in the stanchion barn only. In spite of this low time per cow per milking, man C showed the greatest idle man time per cow. Man B was slowest in getting the work done in both the stanchion and elevated-stall barns. Apparently he was not able to take advantage of the change in physical facilities and arrangement. This, of course, points up the importance of the man or human element in achieving labor efficiency. Some supervision was given each worker. Nevertheless, the variation in time used by the three men in doing the various jobs emphasized that arrangement of building facilities and equipment must be considered together with the skill and ability of the worker.

In all time studies, the general procedure followed was setting up machines and equipment, getting cows into holding pen, turning in, feeding, washing udders, attaching milkers, machine stripping, turning out, and pouring milk. Cows were turned in and out in groups of eight in the stanchion barn, but by twos in the elevated-stall barn.

The elevated stalls, as built, did not provide for individual side entry and exit. In a number of cases this slowed the milking operation, since a cow could not come into either stall until milking of both cows was completed. It seems desirable to modify the stalls to provide for side entry and exit. This modification is included in the plan and can be done at little extra cost.

A major advantage of the elevated stalls over the stanchion barn was elimination of stooping and squatting. This made the job considerably easier for the worker.

Clean-up time was only 0.3 minute per cow per milking for Man C as compared with three to four times that much for the other men. This is evidence that 10 to 15 minutes daily can be saved in clean-up time when milking about 20 cows in a barn of this type.

SUMMARY

The elevated stall milking parlor designed by the Agricultural Experiment Station is practical and economical for producers of manufacture-grade milk. Some dairymen may not be able to take advantage of such a milking area to reduce the time required for milking; however, there is little doubt that milking is made easier by reducing stooping, bending, and squatting.

Elevated stalls make it possible for the worker to do a better job of clean-

ing udders and machine stripping. They do not permit easy inspection of udders from both sides as in the case of milking in a stanchion barn.

A walk-through arrangement of stalls in tandem does not permit full use of milking machines and man time. Therefore, facilities for side entry and exit of cows from stalls appear desirable.

Plans for the two-stall milking barn described in this leaflet are available from the API Extension Service, Auburn, Alabama. Request plan No. BH-36.