



THE MILKING MACHINE

WITH the present shortage of skilled farm labour, many farmers with medium to large milking herds are in a serious predicament. They realize that Britain is leaning heavily upon this country for a supply of cheese and other dairy products. They also feel that with sons and hired help in the armed forces or engaged in war-time industry, and with no one to replace them, they cannot continue to milk as many cows as usual. If fewer cows are milked we may expect less cheese and other products available for export at the time when Britain is needing more of them. Should this happen, Canada would be failing to play her part in the war effort, and the consequences might be disastrous. Each farmer must therefore ask himself, "Am I justified in producing less milk when there is such urgent need for increased production?"

Relief for the Labour Shortage

To urge increased milk production is easy. The important question is "How can it be done?" Pasture improvement¹ and better feeding will help. Raising the general level of production through cow-testing is another means. Although cow-testing is a highly desirable practice for every dairyman, it does not provide immediate relief from the labour shortage. For many farms the answer may lie in the introduction of mechanical milkers to replace human labour. Milking machines take much of the drudgery out of milking. A well-grown boy or girl can milk up to 20 cows an hour with a machine, and with far less effort than a good hand-milker expends in milking 7 to 9 cows by hand in the same length of time.

Size of Herd

The larger the herd, the greater the saving in time and money, since the initial cost of the equipment and the time required to care for the machines (per cow) is proportionately smaller. In ordinary times it is generally considered that 15 *average* cows represent the minimum number where it would pay to install a milker. With really *good* producing cows, the minimum might be as low as 8 to 10 cows. However, these are no ordinary times, and farmers should give serious consideration to the question of installing a milking machine, rather than milking fewer cows.

¹ See War-Time Pamphlet No. 15, Pasture Improvement for Cheaper Production.

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Efficiency of the Operator

While there may be differences in the efficiency and economy of the various milking machines on the market, these are less important than the efficiency of the operator. Unless the prospective operator is prepared to study his machine, its application to the cows, the reaction of the cows to the machine, and to attend to the very necessary details of care and cleaning, he would be well advised to continue with hand-milking. Poor machine-milking can be a potent source of loss both in capital outlay and in the quality of the milk produced.

Cost of Milking Machines

Milking machine outfits vary widely in cost. However, price should not be the main consideration in choosing a machine. More important is the reputation of the manufacturer for quality and service. A reliable company is not likely to go out of business, leaving the farmer unable to obtain new parts as needed. It is much safer to buy a machine which has proved its dependability than to buy one of doubtful reliability made to sell at a low price.

Labour Saving with Machine Milking

While the size of herd and other factors influence the amount of saving, it is generally considered that machine milking saves from one-third to one-half of the labour cost of milking. Even more important to-day, the milking machine enables women, teen-age children, and older men to look after the milking where the regular help is no longer available.

Effect on Production

Studies conducted at various experiment stations have shown that a well-handled milking machine has little or no effect upon the amount of milk or the fat test. Where a slight drop was noted, it was believed to be due to leaving the machine on too long. Six minutes is believed to be quite long enough, while many cows are practically milked out within four minutes. Manipulation of the udder and drawing down on the teat-cups just before removing them will aid in getting the last of the milk. Where this practice is followed, hand-stripping is unnecessary except with the occasional cow which does not respond to the use of the milking machine.

Milking Machines and Mastitis

Although there is a general impression that milking machines favour the spread of mastitis or garget, there is little definite experimental evidence to support it. It is a good practice with hand milking, and even more desirable with machine milking, to examine the first few streams from each teat with a strip-cup. In this way, any thick milk or flakes denoting udder trouble can be seen and treatment started at once. Dipping the teats in a chlorine solution *after* milking is regarded as helpful in preventing the spread of mastitis to healthy animals. Further information concerning mastitis is given in Special Pamphlet No. 31, issued by the Agricultural Supplies Board, Ottawa.

Earlier Prejudice Against Milking Machines no Longer Justified

Although in Canada the number of machine-milked herds is steadily increasing, there is still a prejudice against the machine in some districts. This is only natural. In many cases in the past, the introduction of machines led to sharp complaints from dairies and cheese factories because of the high bacterial contamination, and much dissatisfaction arose.

Satisfactory results with the milking machine can only be obtained where bacterial contamination is kept at a minimum. The milking machine with its yards of rubber tubing affords an ideal breeding place for bacteria. Unless proper steps are taken, these bacteria grow rapidly in the tubes between milkings so that enormous numbers may be washed into the milk at the next milking.

Early directions for cleansing were too time-consuming, while the "short-cut" methods sometimes adopted led to complaints and rejection of the milk. Faced with this situation, many farmers discarded their milking machines and returned to hand milking. Of recent years, however, the situation has changed. Simple, cheap, quick methods of cleansing are now available whereby milk drawn by machine may equal or surpass in sanitary quality that drawn by hand.

A Simple Method Now Available

While a number of simpler methods of cleansing milking machines have been developed, the cold lye solution method used at the Central Experimental Farm since 1930 has important advantages. No hot water is needed for washing the rubber parts as the lye itself helps to dissolve remaining traces of milk; the lye solution is cheap and does not readily lose its strength; and lye can be obtained without difficulty. The one disadvantage in the use of lye solution is that it cannot be used on machines having aluminum parts in the milk tube system. This does not apply to aluminum pails as the solution does not come in contact with them.

The use of a large crock or other container to hold the lye solution and tubes is not recommended. Instead, the tubes should be hung up on a "solution rack" and filled with fresh solution after each milking. This gives much more satisfactory results than does the "crock" method. Solution racks may be purchased from most milking machine manufacturers or may be easily built at home. A simple home-made rack is illustrated here.

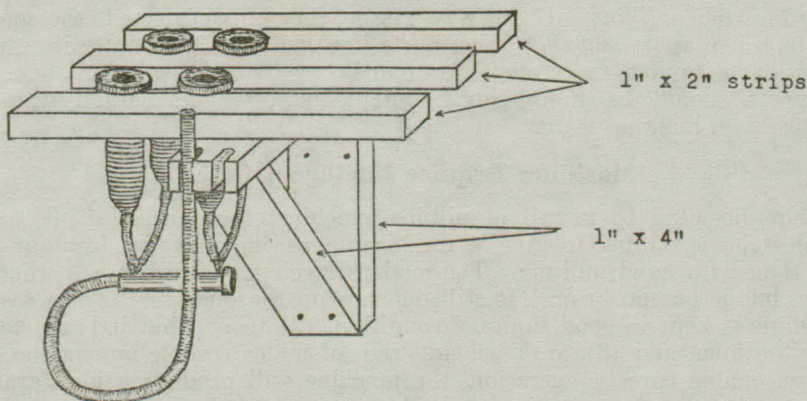


Figure 1. Home-made solution rack for holding teat-cups and tubes. The top of the long milk tube must be above tops of the teat-cups to make sure that these are completely filled with solution.

Directions for Care of the Milking Machine

1. *Immediately* after milking the last cow, and while the engine is still running, suck a pailful of clean cold or lukewarm water through the teat-cups and tubes. Raise and lower the teat-cups so that air and water alternately surge through the tubes. This causes greater expansion and contraction and removes more of the milk residue.

2. Disconnect the milk and air tubes from the pail-head and place teat-cup assembly on solution rack. Fill the teat-cups and milk tubes with a weak lye solution.

Preparing Lye Solution:

- (a) *Stock Solution:* Dissolve 3 tins (10½ oz. size) of good grade lye in 1 gallon (Imperial) of cold water. This is best done in an enamelled pail, as the intense heat developed may crack a glass jar. Place this "Stock Solution" in a glass or earthenware jar and keep tightly stoppered and out of reach of children.
- (b) *Soak Solution for Filling Milk Tube System:* Dilute 4 oz. of stock solution to 1 gallon with clean cold water. This should give a solution containing slightly less than one-half of one per cent of lye, and having a distinctly slippery feel. (Keep a glass liquid measuring cup in the milk room for use in measuring out 4 oz. of the stock solution.)
3. Dismantle the head of the machine and place the vacuum check valve in lye soak solution.
 4. Brush the pail and pail-head with warm water containing dairy cleanser, then rinse and sterilize along with the other utensils.
 5. Just before milking, drain the lye solution from the tubes and use it to scrub down the milk room floor. Replace the check valve and assemble the machine.
 6. Once a week, dismantle the milk tube system, adjust the length of the liners (where necessary), replace badly cracked rubber parts, reassemble and fill with lye solution.
 7. Once a month, clean the vacuum pipe line according to the directions supplied by the manufacturer.

Satisfactory results can only be looked for where the required steps are taken after each milking. If for any reason they are neglected, the machine should be taken apart and the rubber parts immersed for 30 minutes in a boiling lye solution of double the strength ordinarily used on the solution rack. The metal parts should be thoroughly scoured, immersed in boiling water for 5 minutes, then hung up to dry.

Machines Require Intelligent Care

Before deciding to install a milking machine, the farmer should realize that unless he is willing to give it intelligent care he may get into far more trouble than with hand milking. The modern mechanical milker is a wonderful machine, but it has no brain. It still depends on the operator, (1) to see that the machine is kept in good sanitary condition, (2) to see that it is not left on the cow too long, and (3) to detect any sign of udder trouble among the cows. Given reasonable care in operation, the machine will produce a high grade of milk, lower the cost of production, and take much of the drudgery out of milking.

Prepared by Division of Bacteriology and Dairy Research, Science Service, Dominion Department of Agriculture.