

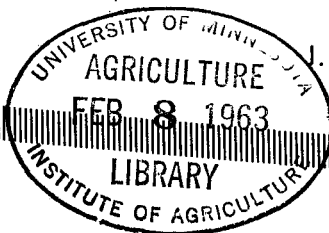
# farm and home

DAIRY  
HUSBANDRY  
NO. 3

## FACT SHEET

### PROPER MILKING PRACTICES

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Proper milking practices are necessary if the dairyman is to harvest all of the milk which has been made available through improved breeding, feeding, and management practices. A good job of milking results in a reduction of milking time, as well as a reduction in the incidence of udder troubles.

The man who performs the milking is of prime importance to a good job of milking. He must appreciate the factors involved in the milking process and the fact that each cow is an individual. He must be satisfied that milking machine equipment is properly installed and then must adequately maintain the equipment for efficient use. A careless milking machine operator or an improperly functioning milking machine can limit the profit obtained from an otherwise successful dairy enterprise.

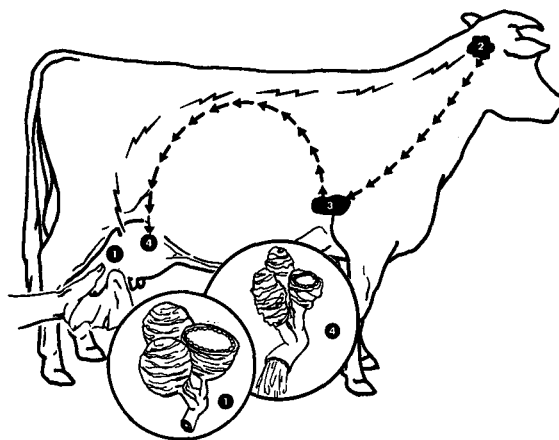
Milk secretion within the udder is a continuous process. Cells which manufacture milk line the walls of hollow spheres known as alveoli (al-VE-o-lie). Each alveolus (al-VE-o-lus) is surrounded by a network of fine blood vessels which supply nutrients for making milk. Alveoli also are surrounded by muscle-like cells which, when contracted, help force the milk from the alveolus.

Forcing of milk from the alveolus is part of the process known as milk letdown. Milk forced out of the alveolus drains by way of connecting tubes called milk ducts to the gland cistern, a holding area within the mammary gland. The gland cistern (holding area) is continuous with the teat cistern, another holding area within the teat. This teat cistern is, in turn, open to the outside by a small duct called the streak canal.

Washing and massaging the udder in preparation for application of teat cups serves a three-fold function. First, it cleans off dirt, and thus limits the amount of contamination getting into the milk. Second, it causes reflex relaxation of the teat sphincter. Third, it stimulates nerve endings in teats.

Follow steps in milk letdown in the diagram below. Upon stimulation (1), impulses are conducted along the nerves which end in the brain (2). When the impulse arrives at the brain it causes release of a hormone called oxytocin into the blood stream (3). The blood then transports oxytocin back to the udder (4), where oxytocin causes the muscle-like cells surrounding each alveolus to contract. This contraction of these muscle-like cells helps force milk out of each alveolus thus making larger amounts of milk available during the milking process.

Since oxytocin is destroyed in the blood stream, the length of time between stimulation and milk removal is important. Oxytocin exerts its greatest effect in aiding milk removal during the first 5 minutes following stimulation. If at the end of 5 minutes the cow is not completely milked out, the amount of complementary milk (milk not available during the normal milking routine) is increased. Inadequate stimulation, resulting in incomplete milk letdown, coupled with incomplete milking may cause short lactations with long dry periods.



Steps in milk letdown. Insert (1) shows relaxed alveolus; insert (4) shows contracted alveolus as milk is forced out.

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## MILKING ORDER

After the teat cup has been placed over each teat, the flow of milk from the teat into the milk pail is effected by applying a continuous vacuum within the teat cup liner. The pulsator causes an alternate vacuum and release of vacuum between the teat cup liner and the teat cup shell. During vacuum release the liner collapses around the teat. This alternating vacuum and release has a massaging effect, thus insuring proper blood circulation through the teat. If the pulsator action is faulty, an incomplete release of vacuum may cause irritation and injury to the teat.

When milk is present within the teat cistern, vacuum applied during the milking process is applied directly to the milk and is not reflected within the udder tissue. When milk flow ceases, the vacuum is applied to tissue surrounding the teat cistern. This reflection of vacuum within the teat cistern can cause injury to the tissue and thus may be a predisposing cause of mastitis.

### USE THESE STEPS TO FAST MILKING

1. Wash and massage the udder and teats with a clean towel taken from warm water containing a sanitizing agent, such as 200 parts per million (ppm) chlorine. Single service paper towels or washed and sterilized cloth towels can be used for washing the udder. This both removes foreign material and stimulates milk letdown.
2. Draw 2 or 3 streams of milk from each quarter into a strip cup. The appearance of the milk in the strip cup aids in diagnosing mastitis. In addition, this (1) helps to wash out any debris adhering to the end of the teat, thus eliminating a possible source of high bacterial count in milk; and (2) increases letdown effect. Never strip the milk onto the floor, since it can serve as a source of infection.
3. Do not allow more than  $1\frac{1}{2}$  minutes from the time of washing till the teat cups are placed on the cow; teat cups should be placed on as soon as letdown occurs. Letdown is indicated by filling of the teats and a general tightness of the entire udder due to an increase in the udder pressure.
4. Watch cows closely; machine strip when milk flow essentially ceases. Machine stripping is merely pulling down on the teat cup with one hand while massaging the particular quarter with the other hand to insure that all the milk has been removed.
5. Treat each quarter individually, since some quarters milk out faster than others. Remove teat cups separately from each quarter when milk flow ceases.

Cows that have mastitis or a history of chronic mastitis are a source of infection to noninfected cows. Whenever possible milk all clean cows first. A desirable milking order is:

1. First calf heifers that have been free of mastitis.
2. Older cows that have been free of mastitis.
3. Cows that have a previous history of mastitis but no longer show abnormal milk, swollen quarters, or red, inflamed quarters sensitive to the touch.
4. Cows with quarters producing abnormal milk.

A quarter milker may be attached to the regular milker unit, so that the infected quarter is milked into a separate container. Milking the infected quarter at the same time as the rest of the udder allows full benefit of letdown, yet permits complete milking without contaminating the remainder of the milk.

### CHECK YOUR MILKING TIME

Multiply the number of milker units used by the number of minutes between placing the machine on the first cow and removing it from the last cow. Divide the total number of unit minutes by the number of cows milked. This gives the average minutes per unit per cow. This milking time includes (1) the time spent in moving the unit from cow to cow and (2) idle machine time. For example, if you're using two units to milk 24 cows and your total time from start to finish is 60 minutes, your average unit time per cow is 5 minutes  $[(2 \times 60) \div 24 = 5]$ . Many good dairymen keep average unit time as low as 5 minutes per cow. If your unit time is too high, one or more of the following factors may be responsible:

1. Operator handling too many units.
2. Doing other chores during milking.
3. Insufficient preparation of cows for milk letdown before machines are attached.
4. Machine left on cows after milk flow ceases. This may cause udder troubles.
5. Machine problems such as worn pumps, plugged vacuum lines, wornout flabby liners, leaky stallcocks, and sticking or leaky pulsators.

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