Dairy Cattle: Priciples, Practices, Problems, Profits
3rd Ed. Bath DL, et al. 1981

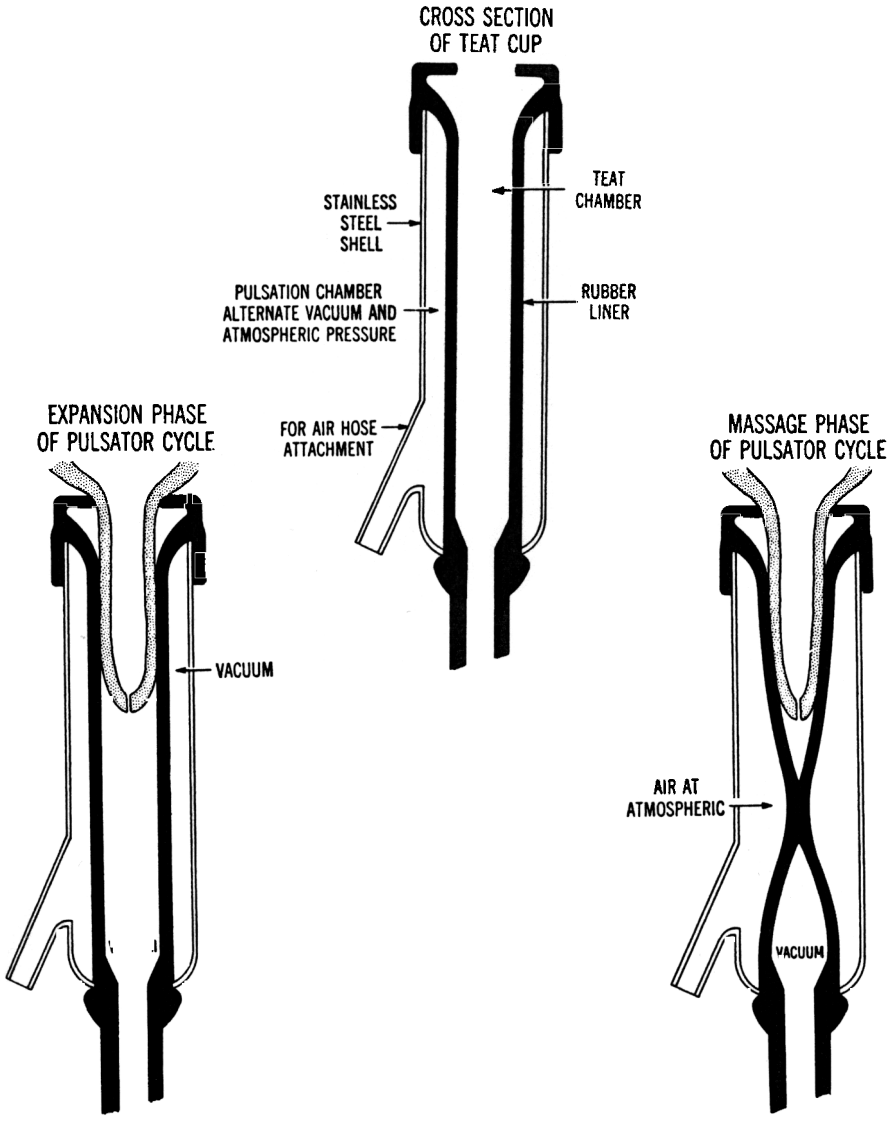

Fig. 19.2 Diagrams of the teat cup at various phases of milking. During expansion phase *(left)* the rubber liner is held by vacuum in close association with the metal teat cup shell, and milk flow rate is maximal. During the massage phase *(right)* atmospheric air enters and collapses the rubber liner around the teat, and milk flow is minimal. There is constant vacuum in the teat chamber of the teat cup. (Reprinted with permission from *The DeLaval Handbook of Milking,* 1963; courtesy of The DeLaval Separator Co.)

usually have less complementary milk, are more persistent, and thus have a higher yield for a total lactation.

19.4 Principles and Practices of Proper Machine Milking

Excellent or poor milking habits can be developed in both cows and dairymen.[7,8] If dairymen train themselves to maintain a calm atmosphere in the barn and to practice good milking habits, most cows will respond favorably. Recommended practices for machine milking are outlined in Table 19.1.

To achieve maximum milk yields dairymen should learn the individual habits of each cow. There is no such thing as a standard cow, especially when it comes to milking habits. With expanding herd sizes, group milking in herringbone parlors, and emphasis on milking more cows per person per hour, this goal of individual attention is

TABLE 19.1 *Recommended Practices for Machine Milking Cows*

1. Establish a regular routine and standard milking interval.
2. Maintain and operate the milking machine in accordance with manufacturer's directions.
3. Wash the udder and teats. Dry teats.
4. Remove 1 or 2 streams of milk into strip cup or paddle for cow-side mastitis test.
5. Apply milking machine within 1 minute after start of wash.
6. Remove milking machine promptly when milk flow stops. Break vacuum first.
7. Apply teat dip to teats.
8. Record milk weights (Chapter 3).

becoming more difficult to achieve. In fact it is probably more economical in large commercial dairies to milk a uniform group of cows as rapidly as possible and to sell those cows that require too much individual attention.

Preparation of the Cow

The teats and lower portion of the udder should be washed with a warm sanitizing solution. A disposable paper towel should be used for each cow. Washing not only removes dirt, but also initiates the milk-ejection reflex. The sanitizing solution should be changed periodically because washing cows with contaminated disinfectant solutions can spread mastitis. Effectiveness of disinfectants decreases as organic matter content increases. Automatic washing devices which spray water on the udder are gaining in popularity, especially in larger dairy farms (Figure 19.3).

Teats should be dried with a disposable paper towel (Figure 19.4) and 1 or 2 streams of milk carefully drawn from each teat into a strip cup (Figure 19.5). Care should be taken to prevent formation of an aerosol. Formation of aerosols may transmit organisms from teat to teat. The first milk drawn is always higher in leukocytes and bacteria and should be discarded. Also, this practice of removing 1 or 2 streams of milk is a quick screening test for abnormal milk (Section 19.8). Milk containing flakes, strings, blood, or other signs of abnormality probably indicates mastitis and should be discarded. Forestrippings should not be squirted onto the floor in stanchion barns, because organisms can be transmitted to other quarters or even other cows. However, this practice is acceptable in milking parlors with grates in the floor

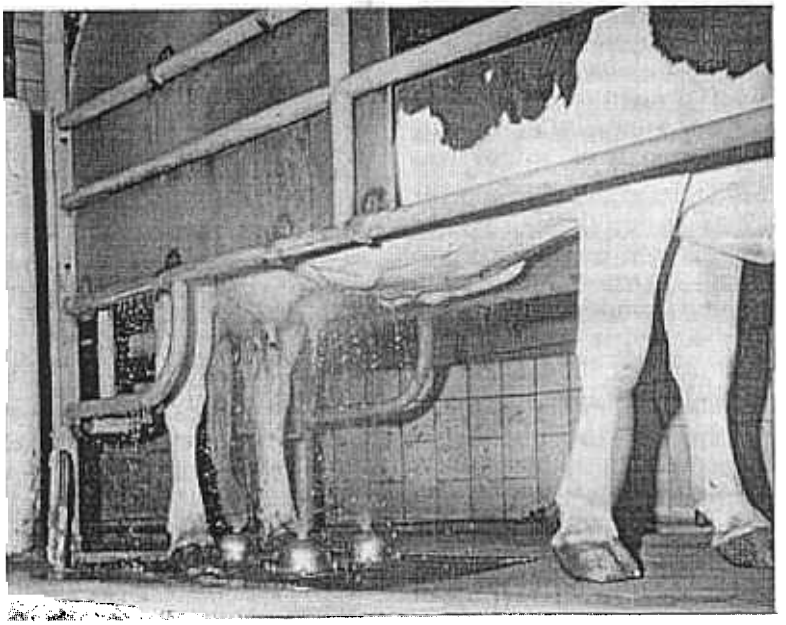

FIG. 19.3 Automatic udder washing device. (Courtesy of L. J. Bush; reproduced with permission from October 1976 issue of Hoard's Dairyman. Copyright 1976 by W. D. Hoard & Sons Company, Fort Atkinson, Wisconsin 53538)

Fig. 19.4 After washing, dry teats and udder with individual paper towel. (Courtesy of L. J. Bush; reproduced with permission from October 1976 issue of Hoard's Dairyman. Copyright 1976 by W. D. Hoard & Sons Company, Fort Atkinson, Wisconsin 53538)

since infected milk can be washed away conveniently without contacting other cows. To achieve maximal release of oxytocin, washing, drying, and removing foremilk (stimulation time) requires 30 seconds. Cows stimulated for only 15 seconds or less require more time to milk.

The milking machine unit should be applied within 60 seconds after the start of the udder wash since effective levels of oxytocin remain in the blood for only 6 to 8 minutes. As shown in Table 19.2, as interval between washing and application of the milking machine increases, time required to milk the cows increases.

Physiological Factors Affecting Milking Rate

Teat cups should be carefully positioned on the teats. Speed with which a cow is milked is of economic importance in the

Fig. 19.5 Use of strip cup before milking provides a warning of abnormal milk. (Reprinted with permission from *Modern Mastitis Management,* 1970; courtesy of The Upjohn Company)

Table 19.2 *How Milking Time Was Affected by Time Lapse between Preparation and Attachment of Milker Unit*

Preparation lag time	*Average time milkers on cows*	*Number of farms*
30 seconds to 1 minute	4 min. 51 sec.	17
1 to 3 minutes	5 min. 31 sec.	24
3 to 6 minutes	6 min. 46 sec.	10
6 or more minutes	6 min. 12 sec.	5

Source: Fryman and Albright, Univ. of Illinois Circ. 851. 1962.