RECENT DEVELOPMENTS AND CURRENT RECOMMENDATIONS IN MILKING EQUIPMENT

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The Dairy Industry, nationally, as well as here in Florida, has undergone many changes during the past 10 - 20 years. It appears now, that we are entering a new era of automation and I believe we can expect changes at an even more rapid rate during this next decade.

Nationally, the total number of milk cows has decreased to about 11 million, which is less than half of the number in 1940, yet our total milk production remains rather constant. Herd sizes are undergoing a very rapid change, the very small herds are disappearing, the number of 30 - 49 cow herds remaining relatively stable but we see a rapid growth in the number of herds of 50 cows or more. Here in Florida for example, in 1964, there were 1463 herds of all sizes and 67% of them were of 50 cows or more. In 1970, there were only a total of 469 herds with 85% of 100 cows or more.

As the herd size increases, it brings with it many accompanying problems. Just the physical handling, feeding, moving, milking, record-keeping of large numbers of cows, presents many problems which were nonexistent with the small herd. Use of "outside the family" labor, obtaining and training this help, then utilizing them to a maximum advantage, imposes requirements for much greater managerial skills.

The theme of this conference is "Producing Quality Milk" so let's talk about some of the problems directly connected with milk harvesting. This steady, twice-a-day chore, makes recruitment of, and keeping of, good help, rather difficult. There is also a necessity of providing them with training on how to milk cows properly, in order to insure a profitable dairy operation.

Some milker operators are better than others - what makes them better? Isn't it true the good operators share a common characteristic? They are knowledgeable in good milking techniques and apply these techniques in their work? They know how and when to stimulate the milk letdown - they know how and when to attach and remove the milker unit for maximum production.

What are the recommended milking techniques?

1 - Wash udder and teats with warm water with germicidal udder wash.
2 - Forestrip each teat - detect abnormal milk - open streak canal.
3.- Attach milker unit - about 1 minute after starting the wash.
4 - Check the udder and remove the unit when cow is milked out.
Usually $2\frac{1}{2}$ - 3 minutes after attachment on healthy udder.
5 - After removal of unit - dip teats in "after milking teat dip.

The above techniques will produce the maximum amount of milk, when followed consistently. Timing, however, is of extreme importance - because once the

letdown has been triggered, - it only lasts for 4 - 6 minutes - and if milker unit is not applied at proper time, you will not obtain all the milk she is capable of giving.

Our own Dr. Mettler has prepared a graph showing typical flow rates - in relation to time elapsed since stimulation was started.

Typical Flow Curves

Dr. John S. McDonald of National Animal Disease Lab. of Ames, Iowa, says that if the milker is attached within a minute of stimulation of letdown, you will get 95% of milk - if you delay the attachment of milker, you will get a linear decrease in amount of milk, and also you will leave more residual milk in udder.

Timing of attachment of milker, therefore, is of great importance to full production.

Once the milker is attached to cow, we come to a rather critical part of the milking act. When should the unit be removed? Since every cow is different - they give varying amounts of milk, they respond to letdown differently, their flow rates vary - this really poses quite a problem for the operator doesn't it? If he is conscientious, he will want to remove it as soon as she is milked out. As he will know that overmilking is recognized as one of the major predisposing causes of mastitis.

These are some of the problems associated with the milking act on commercial dairies.

What has De Laval done about them?

As early as 1959, De Laval started research on automated milking system. In 1965, U. S. farm paper editors were given a preview of our concept of the automated milker at that time. Our work up to this point centered around a mechanical, unit-removal system, automatic feeding, washing and record-keeping. All of this designed to make the job of milking cows more appealing to the man.

After several years of research in this direction, we re-evaluated our work and realized that we were not fully taking into account the normal, physicological characteristics of the dairy cow herself.

We then altered our objectives and proceeded to develop a milking machine which is capable of utilizing all the forces affecting the cow at milking time.

Finally, in October, 1970, we introduced the De Laval Model 200 Milker - the first milker that is controlled by the cow herself!

How the 200 functions

The 200 is very similar in appearance to our Model A Weigh Jar System.

The 200 goes through 3 phases in milking an individual cow -

Phase #1 - soft, gentle stimulation phase. The vacuum is only 10", pulsation rate only 30, and ratio 30/70, i.e., liner closed 70% and open 30%.

This mechanically stimulates the letdown and assures constant, uniform stimulation. Operator only washes teat, dries, forestrips and attaches unit.

When milk flow from 4 quarters reaches ½#/Min., unit automatically shifts to Phase #2.

Phase #2 - provides the same fast, gentle "soft touch" milking as our Model 100, introduced in 1962, for the modern dairy cow. In Phase #2, a light comes on, visually informing the operator, this cow is now milking - Vacuum 15", pulsation rate 60, ratio 70/30. As soon as cow is milked out, and flow rate drops below ½#/Min., a 10-15 second time delay is activated to provide for milking out uneven quarters, before the unit shifts to Phase #3 and light goes out.

Phase #3 - is post-milking massage phase same as Phase #1 - i.e., 10" vacuum, 30ppm and 30/70 ratio, but for a different reason. This soft, gentle massage, now stimulates circulation of blood to teats and also helps to close sphincter muscle. Unit stays in Phase #3 until operator removes - which can be at his leisure - as it has no ill effect on cow.

That's how the 200 operates - what benefits can be derived from its use?

From the operator's standpoint -

1 - make many decisions for him.
2 - permit him to work in parlor in routine manner.
3 - relieves the pressure on him to remove units at proper time.
4 - less fatigue.
5 - enable him to milk more cows per hour.

From the cow's standpoint -

1 - uniform stimulation - better response.
2 - faster milking - unit in place - full advantage of peak letdown pressure.
3 - more complete milking - less residual milk.
4 - lower CMT - better production.
5 - improved teat ends - less new infections.
    a. Dr. Philpot[1] - "teat end-focal point of all Mastitis Control Programs."
6 - possibly 1 or 2 more lactations - (and possibly 1 or more heifer calves).
    a. culling rate
    b. cow reaches full production 3 and 4 lactations.

From the owner's standpoint -

1 - increase production - increase profits -
    a. lower CMT = more milk
        (1) Dr. Philpot[1] CMT T - 3%
                              1 - 9%
                              2 -27%
                              3 -46%

2 - less vet expense - more profits.
3 - produce better quality milk - more profits.
4 - attract better calibre labor.
5 - greater utilization of labor.
    a. more cows/man/hr.
6 - retain good help
    a. easier, more pleasant working conditions.
7 - peace of mind - assured good returns on investment.
    a. 200 doesn't require skilled operator.
    b. assured of protecting udders.
8 - permits expansion - yet retains good control.
9 - production records - easy to obtain.

Many Dairymen are faced with a decision - either expand or get out of dairy business. We believe the Model 200 makes it possible for him to expand to an economic-size unit and yet retain good control of the operation.

I appreciate this opportunity to present information on De Laval's Model 200, our latest contribution to the U. S. Dairy Industry, designed to enable the Dairymen of the 70's to operate profitably.

References:

(1) Philpot, N. 1971 What Research Tells the Dairyman About Mastitis. National Mastitis Council. February, 1971.