

Udder health: the importance of consistent milking procedures

Whether a dairy milks 50 or 5,000 cows, there is no more critical management practice than having the milking operators perform proper milking procedures through an agreed-upon routine. Milking operator functions are directly linked to milk production goals, completeness of milk harvest, maintaining udder/teat health and labour efficiency.

In addition, in a quality-driven industry, dairy producers need to do everything they can to meet the processor's quality expectations and, more importantly, the demands of consumers.

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While milking procedures and routines may be influenced by different customer segments or regulatory guidelines, the end result must produce a safe, gentle, quick and complete milk harvest.

Milking procedures or routines that do not follow a consistent and repeatable process – or are omitted

Milking routine versus milking procedures

While often interchanged, the two terms 'milking routine' and 'milking procedures' have some important differentiations.

A milking routine can be described as the system by which operators move through a milking parlour. It is the consistent choreography carried out by each milking operator to ensure the important timelines that revolve around the cow's physiology (milk let-down) and the dairy's efficiency goals (throughput) are achieved.

Milking procedures are the sequential steps that define that routine. In other words, the cow-side activities performed by each operator, such as teat-cleansing, fore-stripping, wiping and teat-dipping.

in an effort to save time, reduce labour or attempt to attach milking units faster – have proven to be a critical mistake on most dairy farms.

A lack of proper operating procedures typically prolongs milking times, reduces operator efficiencies and increases the risks of poor udder and teat health.

Milking procedures and the correct timing

When discussing milking procedures, it is important to recognise the options available and the time it takes to properly complete each task.

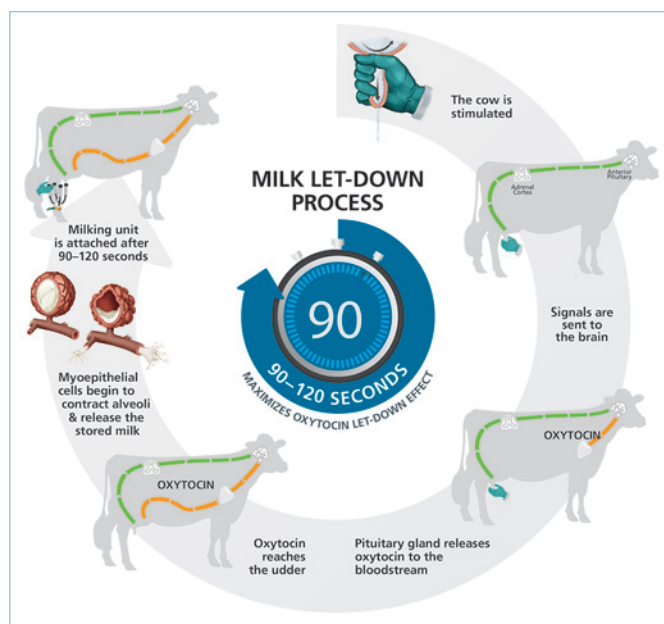
Time spent doing each pre-milking, milking and post-milking procedure must be considered if milk-harvest goals and objectives are to be accomplished.

Typically, combinations of the tasks shown in Table 1 are completed in the milking process.

Timing is everything when it comes to proper stimulation and optimal milk harvest. If the milking unit is attached outside of the timeframe required for oxytocin to reach the alveoli, or is attached after the effects of oxytocin have left the udder region, the milking session is not working in synergy with the cow's body and milk flow will be compromised.

Table 1. Milking process tasks.

Procedure	Time (seconds)
Pre-milking	
Udder preparation (observe, wipe, cleanse)	10-30
Pre-dipping, if applicable	5-10
Fore-stripping	7-5
Wiping	5-10
Milking process	
Attach and align	5-10
Post-milking procedures	
Manual detach	10-30
Post-dip or spray	5-10



Milking procedures and timing of the steps to the routine should complement the cow's physiological response to milk let-down. Keeping this timing in mind will allow a dairy to meet milk harvest goals and objectives.

Research shows that the optimal time to attach the milking unit is 90-120 seconds after the start of stimulation in order to maximise the milk let-down effect of oxytocin and truly optimise the milk-harvest process.

The goals of the milking procedures should be simply stated as a process providing an opportunity to milk a clean, dry, well-stimulated teat.

Environment, degree of automation (for example, automated dipping technology along with automated detachers), housing, bedding, management practices and regulatory guidelines will influence the practices used.

The successful completion of the milking procedures allows the dairy to meet the following goals:

- Achieve a complete milk-harvest process.
- Minimise risks of new infections.
- Harvest milk of high quality.
- Establish a safe and friendly environment for the operator and the cow.

- Maximise cows milked per operator hour as defined by management objectives.

Post-dipping as a key factor for teat health

Once the milking unit is removed, a post-dip that has been tested using NMC protocols and proven effective should be applied, covering 75-100% of the teat surface.

Mastitis-control programmes stress the importance of post-dipping. The milk film remaining on the teat after milking may provide food for bacteria and attract flies which have the potential to spread bacteria from cow to cow after milking.

Dipping teats with an NMC protocol tested post-dip will kill micro-organisms or bacteria present at the end of milking, and reduce new intramammary infections by at least 50%.

Post-dipping can also help to prevent colonisation of organisms

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Operators should be sure to thoroughly post-dip all four teats (75-100% of teat surface). Disinfecting teats with an effective post-dip can reduce >50% of new infections.

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within the teat canal. Contagious organisms present inside the udder may come in contact with the skin of the teat during milking and/or contaminate milk-contact surfaces, such as liners.

Proper post-dipping will provide the germicidal protection cows need directly after milking and during the period between milking sessions.

In addition, post-dip products have skin conditioners that are formulated to restore moisture on the teat skin surface and keep teats soft and pliable.

Teats are subject to different climates and conditions that dry the skin of the teat.

Germicides also have a tendency to dry teat skin, which also makes the use of conditioners important. If the skin is healthy, there is less opportunity for bacterial growth on the teat skin itself, and this will help in the control of udder infections and help in keeping the cow comfortable during milking.

Cluster disinfection to avoid transmitting bacteria

Mastitis can come from contagious or environmental organisms.

Contagious organisms are transmitted from one cow to another, while environmental organisms are those present in the cow's environment that she brings with her to the milking session.

Contagious organisms live in the milk or the skin of the cow, on the operator's hands and in other items shared between cows, such as towels used to wipe and dry the teats of multiple cows (instead of individual towels per cow as recommended) or liners that are not changed or sanitised properly.

It can be argued that equipment does not cause mastitis; bacteria causes mastitis. If bacteria are not present, then the equipment has nothing to transfer from one cow to another. However, completely

eliminating bacteria from the milking environment is not feasible, and high concentrations of bacteria near the teat orifice will eventually lead to higher rates of mastitis.

Even though what facilitates those bacteria making their way into the udder the majority of the time are poor milking procedures and herd management, equipment function (or malfunction) can also play a minor role.

During the milking session, there is a potential transfer of mastitis pathogens via the milking unit and liners. Disinfecting the milking units between each cow can reduce the transfer of mastitis pathogens between one cow and the next.

- This can be done automatically with a backflush system that 1) runs water through the claw, 2) runs a sanitising solution, 3) rinses and 4) dries with air.

- The practice is also done manually by having a bucket with a sanitising solution where the operator submerges the liners two at a time. However, unless this practice is done properly, the procedure may

spread mastitis organisms and cause liner slips during milking.

In fact, it is important to recognise that while disinfecting the units between cows can be advantageous to prevent the spread of mastitis from cow to cow; it is no replacement for sanitising teats with an effective post-dip.

Automated milking and 'in-liner' automation

There should be no compromises when it comes to automating milking procedures on a robotic milking system. Each step, as described for conventional purposes, is just as important in robotic facilities when it comes to achieving a herd's milk quality, production, and efficiency goals. Plus, when it comes to automated milking procedures, cows welcome the ultimate in consistent, standardised processes that only a robot can provide – day or night.

GEA automation performs all of the recommended manual milking procedures using automated technology for a consistent and standardised prep routine, at every milking. Once the individual teat cups are attached, automated stimulation begins with a soft pulsation of the liner. At the same time, teats are cleaned either with water or a pre-wash/pre-dip solution (depending on country-specific regulations).

Teats are then dried and fore-milk is extracted and examined – by quarter – for colour, conductivity, and temperature using a system of milk sensors. With GEA automated milking robots, the milk harvest period begins on a clean, dry, well-stimulated and quality-checked teat.

Teat cup detachment can occur by detecting low milk flow by quarter if desired – so no over-milking occurs.



Disinfecting the milking units between each cow can reduce the transfer of mastitis pathogens between cows.

In GEA's robotic systems, post-dipping even occurs in-liner, just before teat cup removal, to ensure complete dip coverage on every teat at every milking.

In general, milk harvest, whether it be with the help of the human hand or performed entirely with the assistance of robotic equipment, must continue to focus on consistent and accurate procedures of udder treatment and hygiene to ensure that cow health and teat tissue are always protected. ■

References are available from the author on request

Avoiding procedural drift

Meeting the expectations of the dairy producer's milk harvest, milk quality, udder health and profitability goals must start with good, sound and efficient operator procedures and routines.

Operators must concentrate on achieving a proper milk harvest and avoid tasks that divert them from the goals of management.

The single largest reason for not meeting performance goals is normally associated with operators not following proper protocols.

Over time, and without regular training, operators can fall back into poor milking habits and become less efficient. This is referred to as procedural drift.

A well-planned dairy with focus on defining, measuring and improving the day-to-day operator processes and procedures is most likely to meet key performance goals and objectives that lead to the overall success of the operation.

GEA's fully automated in-liner milking processes perform the recommended manual milking procedures inside the teat cup.

