Parlour management and hygiene to maximise milking efficiency

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In the last few decades the dairy sector has changed a lot. Dairies need to be managed much more intensively due to the fact that they have became larger and more productive and more milk has to be harvested. Efficient use of labour and the ability to attract and keep highly qualified employees is often a difficult challenge.

On the other hand, consumers demand high quality and safe products. To achieve all that extensive research in hygiene, milk quality, herd and parlour management and new milking technologies it was necessary that new and innovative products entered the markets.

On most commercial dairies, the parlour is one of the major capital investments where the primary income is earned, where much labour is employed and the quality of the milk production is determined. Therefore, parlour performance and parlour efficiency discussions are still common in today's dairy industries.

Parlour management combines mechanical and technological performance with the ability of a successful relationship between humans and animals.

In a parlour, it can be easily seen at the beginning of the milking process if the animal feels uncomfortable – the milkability is poor when cows move and step excessively during udder preparation practices. Stepping may also be seen soon after the units are

Monitoring of milking process via DPView.

attached and/or near the end of milking, often leading to a significant number of units being kicked off during milking.

Consistently used milking routines with successful stimulation of the cow result in excellent milkability. In addition, having excellent milk flow with a steady, visible increase in flow until peak levels are reached is ideal. Milk flow will drop off rather quickly after peak milk flow reaches a plateau for 60-120 seconds. As the end of milking nears, milk flow should suddenly drop to very low levels. Smoothly removed teat cups follow the proper detachment settings.

There should be minimal stepping and kicking throughout the entire milking process. Good milkability requires adequate oxytocin release prior to units being attached to cows. However, this creates a major dilemma in the industry. To achieve better performance from a parlour, the goal often becomes focused only on milking more cows per hour. When more cows are milked, there may not be enough time allowed to properly prepare cows for effective cleanliness and maximum oxytocin letdown.

Balanced milking routines being executed by the milkers can help to avoid that dilemma, especially in large group parlours.

Training and monitoring

Providing training and monitoring milkers is a constant challenge for dairy producers. In parallel and herringbone parlours with multiple milkers it becomes very important to train teams of milkers working together to improve parlour performance.

Furthermore, the trained daily milking routine preserves udder health, meets legal standards, ensures a hygienic milking and still allows/enhances high milking parlour throughput.

'The one size fits all' approach for milking routine does not exist, because every farm has its own unique conditions and requirements. There are, however, certain principles that should be taken into account in every routine. These involve cow physiology.

For a quick, gentle and efficient milking it is essential that the cow is ready to be milked. In order to achieve a well stimulated cow, the cow needs a stress free environment, tactile stimuli on the udder and some time.

In parallel and herringbone parlours operators are mobile and able to perform multiple

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Fig. 1. Cow with bimodality milk flow characteristic.

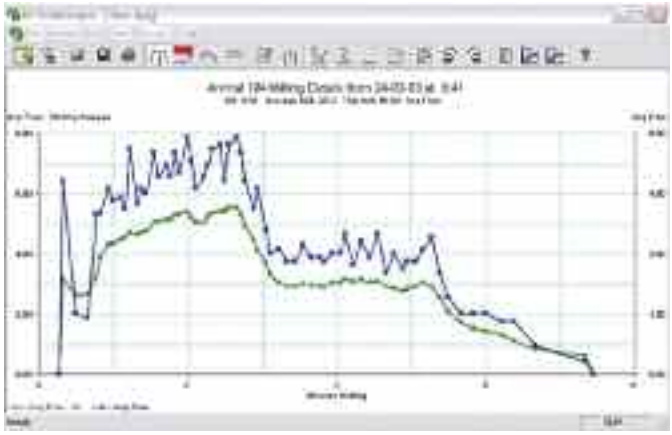
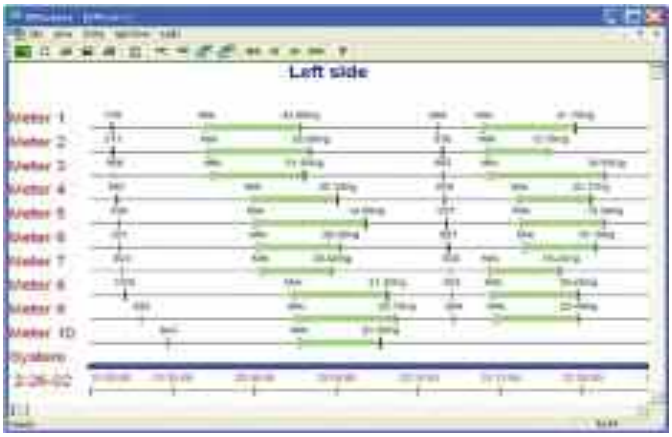


Fig. 2. Working routine – group parlour.



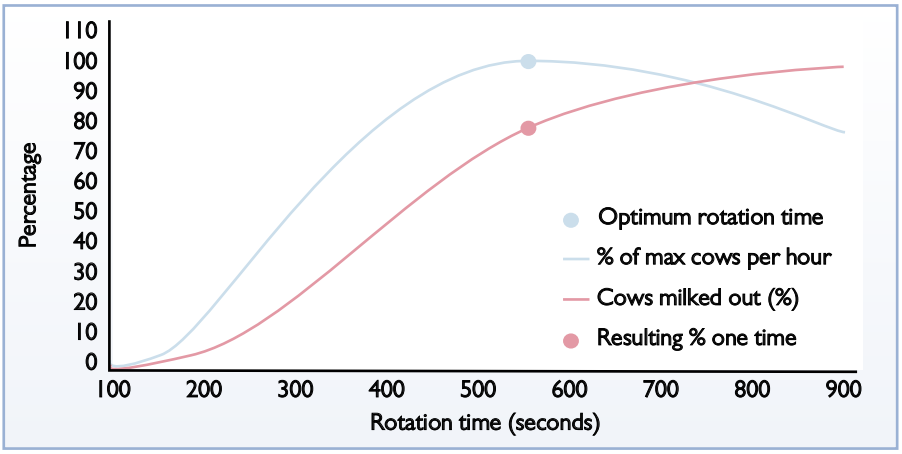


Fig. 3. Rotary parlour – optimal rotation time.

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tasks (pre-dip (if required), strip, wipe, attach, post-dip) as compared to rotary parlours where the milkers are fixed in one location and only perform one or two tasks in this location. To maximise the performance of multiple operators in parallel and herringbone parlours, operators will have to work according to a special scheme using a grouping or sequential milking routine.

The success of a milker training can be shown using special parlour management functions of herd management software like DMS 21. The combined performance of individual milkers and the process control can be monitored. The software prepares reports to analyse the milking process involving data from animal identification and milk data acquisition. It shows:

- Reporting periods of milking – on herd and group level.
- Milking times (duration, start and end).
- Milking performance (milk yields per milking, average milk yields, milk per hour).
- Interferences (detection rates).
- Milking quality parameters (milk flow curve parameters, stop buttons counter).
- Analysis of milk flow curves to monitor the milking process.
- Analysis of the milking routine.
- Analysis of milking start – first two minutes of the milking including numbers of milkings with a second letdown (bi-modality).
- Milk flow characteristics (percentage) of the entire herd or of the individual animal.

All information is available after each milking, can be stored, and then compared to review and optimise the efficiency of milking.

Systems equipped with milk metering systems and interfaces to the parlour management allow fine tuning changes to the take-off settings and vacuum levels, while monitoring the results on parlour performance summaries. The goal is to maintain or increase the pounds of milk produced on a per cow basis, while increasing the flow rate per minute of unit attached. This, in turn, will reduce the unit on time.

The milking stall's characteristics are displayed graphically by DPView during the entire milking process. In external rotary parlours where not all stalls can be monitored by the operators it is very important to have all information available centrally and in time to manage the milking process with high efficiency. Features include:

- Displays the animal statuses (last low milk, dry, separation).
- Fast cow action entries via hot-keys (touchscreen).
- Enter new cow numbers with Responder.
- DP Voice – acoustic output in many languages.
- Displays information such as number of cows milked, milk quantity/hour, rotary milking parlour speed/hour and milking duration.
- Kicked clusters.

In order to increase parlour efficiency and hygiene GEA Farm Technologies has developed a new cluster. With the IQ (Individual

Second round cow traffic.

Quarter) cluster milk flow is much faster, even for high production cows, which means reduced unit on time. No air leakage during attachment makes cows calmer, especially first calf heifers. The slim design makes the cluster much harder to kick off. The unique vacuum-shifting feature prevents contaminants from being sucked into the milk line when the liner is not attached. This means cleaner filters and lower bacteria counts.

IQ makes operators more efficient. Flexible unit attachment allows operators to choose whether they want to attach all four liners at once or one at a time. There is no need to squeeze tubes to shut off vacuum, which means even inexperienced operators can be more efficient. Better unit flexibility and alignment makes for fewer trips back to clusters already attached because of less slips, squawks and kick-offs.

Ergonomical environment

When it comes to increased work efficiency in the parlour the environment of the operators cannot be disregarded. Long milking times and consistent work routines provide physical and mental stress. To prevent rapid fatigue it is necessary to make the working environment for employees as convenient as possible. In addition to adequate light and air conditioning in the parlour, the correct posture while working is important to protect health and performance.

Use of a height adjustable floor can serve here to compensate for different body heights of the staff. Changing height adjustment can also alleviate different strains of the muscles and prevent premature fatigue. New milking unit developments relieve the milker by lowering the weight significantly.

Furthermore, milking cluster support arms not only provide better positioning of milking units on the udder but also weight relief preparation and alignment to the milker.

Sizing milking parlours

As the size of dairies increase the sizing of milking parlours becomes more complicated. Dairy owners usually have a personal preference for a certain parlour type. This personal preference often conflicts with the number of cows to be milked, length of the milking shift, anticipated milk quality, udder health and financial resources. The selection of a milking parlour should be influenced by the initial herd size, expansion plans, economic impact on the dairy, and the ability to train and manage employees.

In the last 5-10 years there has been a renewed interest in external rotary parlours. Today's rotaries are very focused on a flexible equipment level to meet the requirements of mid- and large herd sizes up to 24/7 operations worldwide. Using an udder spray box for post-dip smaller external rotaries are able to milk more than 150 cows per hour with one operator. Features like an 'intelligent' second round can handle cows that are not milked out and cows with milking failures. Continuous rotational speed is set to match the working routine of the operators. This increases throughput of milked cows per hour. In order to handle milking units below the cow traffic, cluster drop is a common function. Milking units can be cleaned up and will not influence the exit and entrance of the cows.

In summary, to increase efficiency of milking we have to fulfill hygiene, milk quality, herd and parlour management requirements. GEA Farm Technologies is working very hard every day to find and create the perfect total solution. As specialists they do not think in components, they think in complete systems to satisfy customers. ■