UDDER HEALTH WORKSHOP (IN FARM)

W11

The importance of milking time assessments (observations and not physical measurements)

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There are International Standards on the procedures and methods for testing milking machines (ISO 6690:2007) and the basic operating parameters required (ISO 5707:2007). As these tests do not include actual milking, the results may lead to an incomplete evaluation and provide misleading results (International Dairy Federation, Bulletin 396/2005).

Objective: To highlight a number of key points that will allow competent personnel to assess the suitability of the milking system.

Materials and Methods: There are three broad areas to consider.

1. *Mechanical observations*

- Vacuum levels – checking the accuracy of the gauge set for the type of machine in operation (high or low level milklines). Too low a level can extend machine on time, increase liner slip and may decrease milk yields. Teat congestion and incomplete milking indicate too high a level.
- Vacuum stability – as important as working level. The vacuum at the receiver vessel should fluctuate no more than +/- 2.0kPa during milking, nor between the receiver vessel and milkline for more than 95% of a normal milking.
- Vacuum in the liner mouthpiece chamber (MPC) - to average at least 10kPa less than the average claw vacuum during peak milk flow. Teat barrel congestion and palpable mouthpiece rings are usually reduced when the MPC vacuum is less than 20 kPa. Higher MPC vacuum levels are observed with over-milking and larger bore liners. The presence of palpable mouthpiece rings on more than 20% of teats warrants investigation (increased mastitis new infection rates).
- Operation of the vacuum regulator. A simple test when air is admitted. Listen to see if the regulator closes off or the speed of a VFC increases.
- Fall off test – to assess if the machine can keep the vacuum level stable when a unit is removed or kicked off.
- Pulsation – listen closely to each pulsator for uniformity. Check liners are fitted correctly and in good condition. Correct liner movement can be assessed using the thumb test.
- Liner slippage – if more than 5% per milking then investigate and action.

2. *Operator observations*

- Attachment of the milking units – with minimum air admission and a smooth, efficient manner. Units must hang squarely on the udder with equal weight distribution between all four teats.
- Removal of the milking unit. Clusters must not be removed while under vacuum. Check for blocked air bleeds which also lead to slower milking, liner slippage and teats being bathed in milk during peak milk flow.
- Over-milking must always be avoided. With twice a day milking, units should be removed promptly when the flow rate drops to between 0.3 – 0.5 kg/min and nearer 0.6 – 0.8 kg/min with three times a day milking. If hand stripping identifies that >20% of quarters yield more than 100ml milk, then investigate.
- Cleanliness of the operator and facilities is essential.
- Demeanour of the operator. Dairy cows respond positively to a quiet, calm and consistent milking environment, including cow collection. If more than 5% of cows defecate something is wrong.
- Consistency of milking routine, with all cows receiving the same preparation intensity and duration, with standard time lags from first contact to attachment of the cluster.
- Milk Let down. Good preparation is essential for good milk let down and achieving less than 10% of bi-modal milk flow. A calm, well stimulated cow should produce around 50% of her production within 2.0 minutes of unit attachment.
- Teat disinfection. Teats should be disinfected as soon as practical after cluster removal, ensuring total teat coverage.

3. *Cow Observations*

- Cow behaviour. An effective milking requires calm quiet cows for optimum milking efficiency and milk quality.
- Teat Condition. Routine assessment of teat condition is part of any milking time assessment. The National Mastitis Council (nmconline.org) has recently updated Teat Condition Scoring.
- Cow cleanliness. Essential for milking efficiency and milk quality. Changes in management, environment and housing can be clearly identified with regular scoring.

Conclusions: Detailed observations at milking time can highlight the strengths and weaknesses of the overall milking process. Any comprehensive assessment needs to take account of the complex interaction between milking machine, operator and cow. Failure to understand the relationship may lead to inappropriate conclusions being drawn and incorrect recommendations.

W12

Milking time assessment – an useful tool in the armoury for a dairy veterinarian

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Background: Most dairy farms have their milking equipment evaluated and maintained on a routine basis. Although proper equipment function is necessary for milking performance, it does not guarantee it. Two management areas that can lead to poor milking efficiency are: 1) milking routines that don't achieve consistent milk letdown and 2) overmilking. Either one of these problems can leave cows 'high and dry' and expose teats to high vacuum levels. Improper function of pulsation, milking vacuum, or the interaction of vacuum with liners and milking cluster design can be also problematic.

Additionally, many dairy operations are increasingly relying on hired labor, especially foreign-born workers. However, many dairy managers have limited human resource knowledge and experience; this often leads to frustration with protocol drift and employees who have little training to understand 1) milking dynamics, 2) the operation of the equipment they use every day, and 3) troubleshooting problems with milking equipment.

Methods: This will be an interactive session in which we will discuss case studies and applied research regarding milking dynamics and the relation to milk quality, udder health, and herd profitability. This will be an opportunity for dairy veterinarians to better understand the impact of milking protocols on milking performance of the cows. What do the cows tell us about their milking experience? What tools and observations can we use to improve the cow's experience? What are the outcomes we should monitor to evaluate changes in protocols and management?

Objectives:

1) Evaluating milking machine performance.
2) Learning observational tools to use during milking evaluation.
3) Tracking outcomes of changes in milking protocols and machine operation.

CATTLE WELFARE WORKSHOP

W14

Animal welfare assessment at farm level and its implications for economic sustainability of dairy farms

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Animal welfare has become an essential aspect of modern livestock production. Animal welfare assessment tools are needed to identify problem areas and monitor progress when improvement strategies are implemented. The objective of this workshop is to discuss the principles underlying welfare assessment and how welfare assessment protocols may be used to improve the economic sustainability of dairy farms.

Animal welfare may be assessed using indicators, i.e. variables that can be measured objectively. Because of the multidimensional nature of animal welfare, no indicator is enough by itself to assess the welfare of an animal or group of animals. Thus, a combination of several indicators should be used if welfare is to be evaluated.

Welfare indicators should meet the following requirements: First, they should be valid, that is, they should really measure animal welfare. The validity of an indicator may be assessed by expert opinion or, preferably, by investigations in which this indicator is compared with an independent measure of welfare. Second, welfare indicators should show a high intra- and inter-observer reliability. Third, indicators should be practical and ideally minimally or non-invasive for the animals.

Welfare indicators are divided into two groups: animal-based indicators and environment or resource-based indicators. Animal-based indicators are all those variables that are measured directly in animals, such as frequency, duration or intensity of a behaviour, incidence or prevalence of health conditions, or plasma concentration of hormones, as examples. Environment-based indicators include the size and design of facilities where animals are kept, the quantity and quality of food they receive, the temperature at which they are exposed, etc.; in short, environment-based indicators are variables that are not measured in animals, but in their environment.

The main difficulty of environment-based indicators is that a given environmental variable can have very different effects on animal welfare. This is due, first, to the fact that individuals of the same species may respond differently to a feature of the environment. A second reason why the effects of environmental variables are not always predictable is that a phenomenon of interaction between variables may occur, often as result of different management within similar environments.

Because the effect of environmental variables on welfare may not always be reliably foreseen, several researchers have suggested that, as far as possible, animal welfare should be evaluated with animal-based indicators that provide direct information on the state of animals. This does not mean, in any way, that environment-based indicators are not useful. There are some welfare problems that may be more easily measured with environment-based indicators. For example, it is