



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



often easier to check that animals have free access to good quality water than to assess any possible state of dehydration. In this case, several environment-based indicators (number, location, operation and design of the water troughs, and water quality) would be more useful than an animal-based indicator (signs of dehydration). Furthermore, although animal-based indicators are especially useful for evaluating welfare state, environment-based indicators are needed to identify the cause of a possible problem and allow for continuous improvements.

Animal-based indicators can be grouped into four main categories: indicators related to the behaviour of animals; indicators related to the appearance of animals; physiological indicators, and indicators obtained from farm records, such as the prevalence and incidence of diseases.

To assess the overall welfare of an animal or group of animals, the protocol used must combine several indicators and include a description of the method to be used to measure each indicator. One of the main difficulties of all welfare assessment protocols lies in the aggregation of different measures to obtain an overall score.

Animal welfare assessment at the farm level largely influences economic sustainability by ensuring compliance with set standards of animal welfare, which then increases societal confidence in that sector and, thus, helps ensure market share. In addition, there is evidence that that compliance with animal welfare standards may also be associated with greater cow health, production, and longevity, which all contribute to greater farm profitability and economic sustainability.

DIAGNOSTIC IMAGING WORKSHOP

W15

Extragenital applications of Ultrasonography

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Objectives: Today, reproductive ultrasonography has a plantar diffusion. The diagnosis of gestation, of non-gestation, the diagnosis of foetal sex and the diagnosis of the physio-pathology of the ovary and uterus, is carried out daily everywhere. Extra-genital ultrasonography, although more slowly, is also becoming more widespread and is beginning to be a complementary examination that the buiatrician who also or only deals with bovine internal medicine relies on to confirm and sometimes define a clear diagnosis. In many cases, the buiitra can carry out this examination without the need for instrumentation other than that used for genital ultrasonography. The aim of this presentation is to show possible applications of the ultrasound technique with instruments and probes, normally used in bovine reproduction, but also how to perform an ultrasound examination of the abdomen using lower working frequencies, and therefore different probes, than those normally used in bovine reproduction.

Materials & Methods: The ultrasound examination of the lung, the teats and the umbilical region of the calf, have one point in common: often the clinical examination, even if well done, does not allow the type of lesion, its extension and therefore a prognosis to be clearly defined. This examination is performed with a 5.0-7.5 MHz linear probe and portable or ultra-portable instruments. The ultrasound examination of the abdomen when performed on calves can be done with a 5.0-7.5 MHz probe, however when working on calves already 90-120 kg and adult cattle, 2.0-3.5 MHz, convex or linear probes must necessarily be used. These probes can be mounted on portable, ultra-portable instruments or on trolley-mounted ultrasound units.

Results: Ultrasound examination of the lung is performed to confirm whether a calf has a respiratory form, to define its site and to establish the extent of the inflammatory process and thus the prognosis. However, this can be used routinely to monitor the nursery by analysing sentinel calves on a weekly basis. This monitoring makes it possible to establish the state of health of the nursery, which animals (of which age group), if any, have problems. It makes it possible to establish the efficiency of the staff also makes it possible to establish whether a therapy and/or vaccination programe is giving the expected result. The ultrasound examination of the teat is an examination that should be used every time we have milking disorders. The clinical examination, in particular the digito-digital palpation of the teat, often does not allow us to establish either the type or the extent of the damage, which may affect the papillary canal, Furstemberg's rosette, the teat cistern, the milk cistern or Furstemberg's ring. The ultrasound examination of the umbilical region makes it possible to confirm and/or make a clear clinical diagnosis of umbilical pathology. Umbil-