Effective cleaning and disinfection on the dairy farm

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leaning and disinfecting is imperative to maintain the well being and health of high producing animals, such as dairy cows. This is especially the case in intensive modern housing where high density and high productivity increases the infection pressure. Thorough cleaning and adapted disinfection decreases the pathogen level and prevents or breaks the disease cycle.

The myth

The ideal disinfectant:

- Has a spectrum adapted to the target.
- Is fast acting.
- Has a sufficient efficiency within the contact time.

• Remains active in the presence of organic matter.

- Has a good material compatibility, for example with metals and concrete.
- Has no or low toxicity for users.
- Has an acceptable ecotoxicity.
- Has an easy protocol of application.

lodine, chlorine, glutaraldehyde, phenolic or quaternary ammonium compounds – none of these raw materials used in disinfectants respond to all these parameters. Thus, synergy is required: a mutually advantageous conjunction of distinct elements to get closer to the 'myth' of the ideal disinfectant.

Complex formulations with several active substances that also contain stabilisers, sequestering agents and buffering agents offer the best compromise. Together with the chemical properties of the disinfectant, the method of application is a key factor to obtain good results.

The reality

One unique disinfectant cannot match all the different sources of contamination existing at farm level. The choice of the product to be used is made according to the answers given to the following questions: • Against which germs am I disinfecting? Know your enemy before the fight!



 Which surfaces have to be disinfected? The disinfectant should be adapted to the material and to the level of organic matter.
 How and how often should I disinfect?

Housing hygiene

Unlike some livestock systems, the dairy farm does not have the luxury of an 'all in, all out' stocking policy. However, the terminal disinfection of individual buildings or boxes is possible.

The reduction of bacteria in the immediate surroundings must reduce the opportunity for bacteria to gain access to the animal and cause diseases.

Remove all bedding and equipment before soaking and cleaning. The nature of the surfaces will influence the efficacy of the disinfection.

Rough, porous surfaces are harder to disinfect than smooth surfaces. Porous surfaces are also harder to clean than smooth surfaces. Porous surfaces will therefore have heavier soil loads after cleaning, which further increases the difficulty of disinfection.

A broad spectrum disinfectant with penetration enhancers should be used (Virocid for instance).

Milking parlour hygiene.

The milking parlour is a high density place so should be disinfected twice daily. Surfaces should be cleaned regularly to avoid multiplication of pathogens in this frequented area. As the milking machine is cleaned every day, it should be the same for the milking parlour itself.

After each milking, rinse the milking parlour with water. Once a week, clean the area with a detergent (Biogel for instance), then disinfect (Virocid is advised because of its broad spectrum, its flexible directions for use: spray or foam or fogging and its noncorrosivity due to neutral pH).

The automatic milking parlour is often even dirtier as the robot can not do everything by itself!

• Calf hut, calf pen and calving box hygiene. Calves need the best possible start in life,

and cows need the best possible start in me, and cows need the best possible care at calving to ensure a good profitable lactation.

Against which germs am I disinfecting? Calf pneumonia and calf scours cost the farming industry worldwide vast sums. The losses result not only from deaths, but from reduced feed conversion, poor growth and the cost of treatment. Focusing on neonatal calf diarrhoea (NCD), the most critical period is in the first few days following birth.

The greatest losses occur when calves are kept in close confinement, where the opportunity for transmission of the causative agents of NCD is enhanced by their build-up in the environment. Pathogens responsible for NCD can be viruses (rotavirus, coronavirus), bacteria (E. coli, *Continued on page 12*

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salmonella) or parasites (Cryptosporidium parvum).

The disinfectant used must have a spectrum covering those three types of pathogens. For bacteria and virus, there are a lot of active substances available on the market (iodine, glutaraldehyde).

For C. parvum it is not so easy. Only a few alternatives are available on the market. Recently, the efficacy of an amine-based disinfectant has been established by INRA. The product, named Kenocox, has a complete spectrum against NCD: it is efficient against bacteria, virus and C. parvum.

Where and which surfaces have to be disinfected? Calf huts, calf pens and calving box have to be disinfected. As the oocysts of cryptosporidium are highly resistant in the environment (survival for several months if not exposed to extreme temperatures), implementing a good cleaning and disinfecting program is critical to reduce the environmental oocyst load. Buckets, feeders and drinkers must also be disinfected and rinsed afterwards.

How and how often should I disinfect? The infectious pressure increases with the accumulation of bacteria, viruses and oocysts in the environment.

The best option is to clean and disinfect before each entry of animals and manage as an all in/all out system.

Contagious and environmental germs

Staphylococcus aureus Corynebacterium bovis Streptococcus agalactiae Streptococcus dysgalactiae Streptococcus bovis Escherichia coli Streptococcus uberis Enterococcus hirae Proteus vulgaris Klebsiella pneumoniae Pseudomonas aeruginosa Citrobacter freundii Enterobacter aerogenes

Table 1. Bacteria tested according to European norms EN 1400 and EN 1656.

People hygiene

The hands of farmers, directly in contact with cows and equipment, can be a vector of pathogens. Fast killing effect, broad spectrum and soft for the skin are the required properties of the disinfectant used for hand hygiene. Decontaminating soap (Kenoderm) or disinfecting alcohol solution (Kenosept) are available.

The critical characteristics required from a disinfectant used in a bootbath are speed of disinfection and broad spectrum.

A disinfectant based on hydrogen peroxide and peracetic acid is ideal for this purpose (Kickstart).

Hand and boot disinfection should be applied by the farmer before and during milking, and also when going from one group of animals to another (for instance dairy cows to then handling calves). This should also be applied to all external people entering the farm.

Milking machine hygiene

The milking machine can be a source of infection and can lead to increased bactoscan results. Therefore, it is of great importance that a strict cleaning and disinfecting protocol is followed.

The milking machine should be cleaned after each milking with an acid or an alkaline. A chlorinated alkaline product allows disinfection of the system.

Peracetic acid combined with hydrogen peroxide are also sometimes used to disinfect the system. The dilution should be carefully selected as it can damage the rubber.

Animal hygiene

The three main diseases with major economic significance are mastitis, infertility and lameness. Two out of three have infectious components. Thus, using an adapted disinfectant is essential for the control of these diseases and consequently for farm profitability.

Teat hygiene.

There are three dangerous periods when cows are more vulnerable to mastitis causing agents:

• During milking, if teat preparation is not optimal.

After milking, if the cow lies down in a dirty area with opened teat sphincters.
During the dry period.

During milking cows 'share' the milking machine and it is a source of contamination from one cow to another cow or one quarter to another quarter. Be aware: whatever bacteria are not removed from the teat surface before milking machine attachment will end up in the milk!

Pre-milking preparation can be realised in a different manner: reusable cloths, soaked in a bucket of detergent solution is the traditional method.

As reusable cloths can be a source of transmission from one cow to another cow, it is strongly advised to use one cloth per cow and to disinfect them between each milking.

A detergent and disinfecting solution can be sprayed on the teats, then the teats are dried with one single paper towel per cow.

With the foaming dip cup it is even better: no water is applied on the udder, thus there is no dissemination of the dirt.

Foam can be considered as a semi-dried method allowing the most hygienic preparation of the teats before milking.

After milking the risk of contamination is high because the sphincter is open and can stay open for up to two hours after milking.

The FAO highlights the importance of the post-milking teat disinfection because it kills possible germs that get on the skin during the milking process.

It is also important to cover the period between the two milkings.

The products of the Kenbo range have proven their efficacy against the main germs causing mastitis. Contagious and environmental pathogens have been tested.

As teat dips are applied twice daily on the skin of the cow, it is critical to use well tolerated formulations. Whereas classical teat dips focus on attack (disinfectant properties), the Keno range focuses on total teat care (disinfection properties of course, but mostly improvement of teat skin and teat end condition). Either Keno Start, Keno Cidin or Keno Lac allow ideal teat skin and sphincter condition.

During the dry period

Hygiene of the cows, directly linked with environment hygiene, is of great importance in mastitis control and prevention. Again with the prevention of a build up of mastitis pathogens in mind, it is important to keep dry cow pens as clean as possible.

Hoof hygiene.

Considerable economic losses are attributable to lameness due to the cost of treatment, decreased milk production, decreased reproductive performance, and increased culling. The incidence of lameness has steadily increased over the last 20 years.

Be proactive! Don't wait to have a high prevalence in the herd before setting up a prevention strategy. The challenge regarding hooves disinfection is to find a disinfectant efficient in heavily contaminated solutions. The disinfectant should also reach the bacteria that are often deep in the tissues.

Herd measures like footbaths, hoof mats and foaming systems are essential to control the spread of the disease. Pediline Pro has been formulated according to these specific needs.

The claws have to be correctly trimmed at least once each year. Individual treatment, including antibiotic and healing processes may be useful.

Conclusion

Bacteria are everywhere: in soil, in water, on animals and on humans. The purpose of disinfection is to decrease infection pressure and thus decrease disease prevalence.

Choosing the disinfectant adapted to each specific situation leads to effective prevention and a profitable dairy farm.