A new concept in milking machine and parlour hygiene

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Mastitis has to be managed because of the consequence on the cows' health but also for economic and regulatory reasons. One European regulation describes the specific criteria on hygiene level for foodstuffs (Regulation (EC) No 853/2004 – see Fig. 1). Understanding the European legislation, you will learn that hygiene is a necessary investment for any dairy production that is striving for quality.

The Bioprotexion concept

Bioprotexion is a concept developed by CID Lines to implement preventive measures at farm level to protect the farm, the people and the environment from the entry of unwanted animals, pests and diseases.

Hygiene on dairy farms does not always meet the highest standards compared to intensive production of poultry or pigs.

As mastitis is a multifactorial disease, global management is necessary. FAO describes a guideline with 10 key points on milk and milking hygiene to maintain or achieve a low level of mastitis on the farm.

CID Lines has taken these rules into account for the development of their Bioprotexion program on dairy farms.

In the Bioprotexion program all the cleaning and disinfecting steps are listed (Fig. 2). The overview allows the farm manager to check the overall hygiene level on his own farm.

It helps him to know if some preventive measures should be added to decrease infection pressure.

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

- During milking, if teat preparation and the milk process are not optimal.
- After milking, if the cow lies down in a dirty area with open sphincters.
- During the dry period, if environment and drying method are of poor quality.

During milking, cows 'share' the milking machine and it is a source of contamination from one cow to another cow or from one quarter to another quarter.

If the teats are not correctly prepared before milking, germs are brought into the system. Keno Pure, a cleaning and disinfecting solution can be sprayed on the teats.

Afterwards the teats must be dried with one 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 dirt from the udder on the teats. Foam can be considered as a semi-dry method providing the most hygienic preparation of the teats before milking.

A complete hygiene program, with products and detailed ways of application are proposed (www.cidlines.com/cowhygiene).

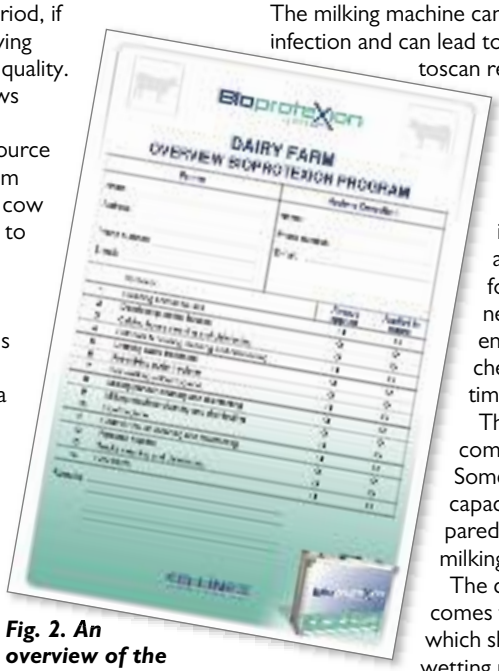

Fig. 2. An overview of the Bioprotexion programme.

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 protocol is followed.

To clean the milking machine, as well as for any cleaning, four key elements are necessary: thermal energy, kinetic energy, chemical energy and time.

The thermal energy comes from hot water. Sometimes the boiler capacity is too low compared with the size of the milking parlour.

The chemical energy comes from the detergent, which should have good wetting properties and which should be capable of emulsifying fatty deposits, softening the water and suspending particles of dirt.

For the milking machine as well as the milk tank, use acid and alkaline products alternatively.

The kinetic energy comes from water turbulence. It is dictated by water volume, flow rate and inclination of milk-lines.

Finally, time is required for the activity of the three other parameters. If the cleaning process is too short, the detergent has not enough time to act. On the other hand, if the process is too long, the risk of redeposit is higher and the temperature decreases too much.

All these parameters are correlated and the optimum combination must be found.

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Fig. 1. European legislation on milk hygiene criteria.

Criteria for raw milk

3. (a) Food business operators must initiate procedures to ensure that raw milk meets the following criteria:

(i) For raw cow's milk:
Plate count at 30°C (per ml) 100,000*
Somatic cell count (per ml) 400,000**

*Consider the rolling geometric average over a two month period, with at least two samples per month.

**Consider the rolling geometric average over a three month period, with at least one sample per month, unless the competent authority specifies another methodology to take account of seasonal variations in production levels.

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Here is the most common advice:

- The temperature of the water has a very important influence on the cleaning result. Make sure that the water temperature at the beginning of cleaning is between 65-80°C and never below 40°C at the end of the cycle (otherwise fat and proteins will adhere again on the cleaned surfaces inside your machine and tank).
- Use an acid cleaner for pipes and tanks (PHO CID) and alternate with an alkaline product (DM CID). An acid cleaner removes calcium and iron deposits. An alkaline product removes fats and proteins. It is formulated to clean and disinfect pipes and tanks. The presence of sodium hypochlorite provides an excellent disinfecting result.
- Rotation of acid with alkaline products will vary the pH, therefore stress bacteria and slow their development. The frequency of rotation depends on the hardness of the water:

– Soft water (<20°dH): use an acid product twice a week.

– Hard water (>20°dH): rotate every day with an acid product.

The ideal cleaning sequence is:

- Post-milking rinse with lukewarm water (30-50°C) for five minutes.
- Main cleaning, with alkaline or acid for 10-15 minutes.
- Final rinse with cold water to remove the chemical residues for five minutes. The pH of the final rinse is the same as the pH of the water used for cleaning: it means that there is no chemical residue.

Fig. 3 shows a document describing the parameters to check if the cleaning protocol of the milking machine is correct.

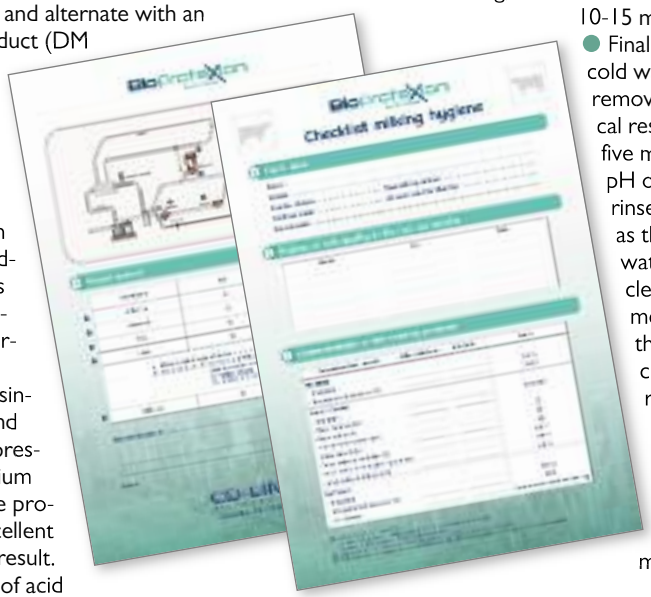

Fig. 3. Checklist for milking hygiene.

Average values are given to allow a hygiene consultant to control the cleaning protocol by measuring the different parameters himself .

Is the milking machine clean after the cleaning process? To answer this question, a visual control is the key. Specific places like liners, claw or reservoir, are easy to check and give a good idea of the cleanliness of the system.

General hygiene

As farmers' hands are directly in contact with the animal and the equipment, hand hygiene is directly involved in mastitis prevention.

- Wash your hands before each milking with a cleaning and decontaminating soap. Keno Derm is approved according to official test EN 1040 and EN 1500.
- Wear gloves to avoid transmission of pathogens. Staphylococcus aureus colonises finger cracks and it can also grow in teat cracks.
- Use a disinfecting alcohol solution certified for the agricultural and food processing industry and approved according to EN 1040 and EN 1500. It is useful, even if wearing disposable gloves, because it helps to decrease infection pressure and transmission from cow to cow during milking via the gloves. Keno Sept G can be used after the milking of a cow with mastitis: the goal is to avoid transmission of germs to the next cow.

Milking parlour hygiene is also of great importance. 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).

An automatic milking parlour is often even dirtier. Do not forget that the robot is not doing everything by itself.

Conclusion

Mastitis is the more expensive disease for dairy producers. As it is a multifactorial pathology, a complete management program to control mastitis must be established. Realistic goals that can be achieved should be fixed (less than 3% new clinical cases per month or less than 5% of the herd culled yearly due to mastitis for instance).

Together with a team of consultants (veterinarian, nutritionist, milking equipment representative and hygiene consultant), the mastitis management program is implemented at farm level.

With the Bioprotexion concept, CID Lines proposes a tool to achieve and maintain a high hygiene leve – an essential parameter to manage mastitis. ■