Good hygiene

Implement a hygiene score for estimating udder cleanliness

To prevent mastitis it is crucial to ensure good hygiene and avoid movement of manure contaminants from environment to udders. You can implement hygiene scoring of udders, thighs and legs and evaluate how clean they are on the score from 1-4, where 1 is the cleanest and 4 is the most contaminated (3 and 4 must be avoided). That would give a more objective and systematic evaluation.

High score for Legs means that you need to keep walkways and lanes clean. High score for Thighs means more cleaning is needed in the stalls and bedding areas. Udder soiling from the front side comes from the legs when cows are lying down and soiling from the back comes from the tale and dirty bedding.
Cubicles of proper dimensions with 4-5% slope ensure that cows lie correctly and manure will end in the walkways behind the cubicle. No matter which material is chosen for bedding, it is crucial to keep cubicle surface dry. To keep the cows clean any soiled or damp bedding must be removed on a twice-daily basis at least. Fresh bedding should be added daily.

Passageways should be scraped regularly to reduce the occurrence of mud and manure being transferred onto cubicle beds via the cows’ feet. Dry environment is crucial to prevent bacteria growth in bedding.
Dry period

Good dry period routines are effective in preventing mastitis

Even though most cases of mastitis occur in the beginning of the lactation, most of the new cases of mastitis occur in the dry period and calving. It takes 7-16 days after the beginning of the dry period before the streak canal is closed with keratin plug. In this period the risk of bacterial intrusion. Depending on the bacteria type and scope of infection, the days after this period the infection may take place. And if it is caused by streptococcus uberis (S. ubevis) the clinical mastitis occurs within 100 days after the intrusion.

Good dry cow routines are important:

• Use of disinfective teat dip cup solutions for the period of 1-2 weeks after drying off. Also for fresh calvers.
• Milking the cows that have milk leakage
• Good milking routines after calving
• Careful introduction of the first calvers into the cow group.
The impact of feeding on udder health and SCC is complex but data shows that malnutrition reduces animal’s resistance to diseases and causes malfunction of the immune system. With changes in animal’s nutrition status at calving and changes in feeding in general, the immune response is drastically reduced. So, the task here is to find the reasons for this imbalance in cow’s nutritional status. Susceptibility to udder infections is connected to the factors like:

- Negative energy balance
- Rapid change in feeding routines
- Lack or excess of nutritional substances
- Feed quality
Avoiding negative energy balance is one of the focus areas in improving udder health. The first 30 days after calving is the time where you need to pay extra attention to feeding routines. This is due to the fact that 70% of treatments for mastitis take place in this period. That is the time when most cows experience negative energy balance. During early lactation, dry matter intake is low, while nutrient demand is high - that leads to cows being in negative energy balance. Evaluate cow’s body condition or observe the development of fat and protein % in milk the first months after calving. Major reductions in components going below 3.0% is a clear indication that the animal has issues with negative energy balance.

Feed intake in the first month after calving is 50-80% of the optimum level. That is why it is crucial to ensure that cows get sufficient amount of minerals and vitamins. Several vitamins and minerals are especially important for immune function, particularly vitamins A and E, zinc (Zn), selenium (Se) and copper (Cu). Cows in early lactations are ranked lowest in the herd and they come less often to feeding place. That takes place during the times when it is less busy. It is important to ensure sufficient amount of feed and 2-5% of feed left before the next feeding. Avoid overcrowding of fresh cows as it restricts intake of certain cows, putting them at greater risk of mastitis.
Implement change of feeding routines over 2-3 weeks’ time. Even smaller changes in feeding can lead to unbalance in the herd and that results in more mastitis cases and increased SCC. High-producing herds are more sensitive to change in feeding. It is beneficial to have as few changes in feeding routines as possible.

Silage quality is crucial to ensure a well-balanced diet that is based on high-quality forage containing moderate concentrations of fiber (around 30% NDF, neutral detergent fiber) and starch (22-25%) and <5% total fat. Rumen structure is an indicator for diet misbalance like acid and excessive intake of protein and minerals. Low pH in stomach leads to slower microbial digestion, while the low rumen structure leads to faster passing of particles from the stomach. This means a higher volume of undigested carbs entering the small intestine and on to the large intestine with a high attenuation as a result.
Physical injuries caused by inadequate stall design are one of the factors that have influence on udder health. Make sure that neck rail is adjusted to cows’ size. Neck rail at feeding area that is mounted too low can lead to injuries of hock and neck. If that is the case, it is recommended to adjust and move neck rail higher.

There should be sufficient space to accommodate the cow. When the cow rises, it requires the freedom to lean forward, move the head up or down, and move forward. When the cow is resting, it must have the freedom to lean forward and move its head up and down.

There are many different cubicle designs. Cows should be able to rise in the cubicle in the same way they do on grass. It is difficult to give specific measurements for the cubicle due to differences in size for different breeds. It is generally recommended that cows have minimum 47 cm place for the head and 168 cm for the body. Besides that, there should be space for the cow to lean forward (minimum 30 cm). Therefore the cubicle should be minimum 245 cm long. If the cubicle is just 215 cm in total length, cows should be able to lean to the sides. Place brisket locator 175-180 cm from the cubicle front and at the height of 15-20 cm with 60 degrees slope. Brisket locator prevents the cow from pushing itself too much to the front of the cubicle, supports the cow when it rises and keeps the cubicle cleaner.
There are a number of critical factors to take into consideration when planning bedding in free-stall barns. The surface needs to be long-lasting and easy to maintain. It should be absorbing well or leading water away. It should ensure good foothold to avoid injuries so avoid surfaces that tend to become slippery when wet. The flooring should be soft and comfortable and not hard, cold and moist. The surface should be made of a stabile material to avoid the growth of pathogenic bacteria. You need to consider the price against the option of reducing or increasing the number of injuries to animals. There are various recommendations for tie-stall and free-stall barns. The most important is if the cows stand and lie in the same flooring. Solutions with cow mats in tie-stall barns should ensure a soft bedding and good support when the cows stand.

Previously, cows used to be on pasture, but nowadays they stay a lot more in the barn.

Flooring and bedding should give comfort to modern cows and would usually be:

- organic material (straw, saw dust and recycled manure solids)
- inorganic bedding (sand and rubber mattresses)
Bedding material affects the udder health. What are the different bedding options and what you should pay special attention to?

**Deep bedding – Sand**
Sand is considered the gold standard in terms of cow comfort, locomotion, milk quality and udder health – both in conventional or robotic operations. Sand helps keep SCC on a low level. If you run robotic operations, keep in mind that sand increases robot maintenance costs.

**Straw, sawdust, kiln-dried shavings and other organic materials**
This group of materials have similar effects in terms of cow comfort, locomotion and cow flow with slight differences, when compared with sand. This kind of organic bedding also has major advantages in terms of impact on equipment, and manure handling. Pay special attention to cow cleanliness, as high bacteria growth could be a problem. Besides that, keep track on your labor and bedding expenses. It is also crucial to ensure consistent hair removal from the udders, as clinging organic manure will affect robot performance. In the next post we will talk about RMS and mattresses.

*Sources: DeLaval and SEGES*
Recycled Manure Solids (RMS)
This kind of material delivers clear advantages in terms of cow comfort, locomotion, cow flow, total cost, and impact on equipment, in addition to availability and management. RMS can be used on top of mattresses with a 5 to 10 cm layer or as deep as 20 to 30 cm of material. Keep in mind that udder health can be compromised representing a potential risk for coliform outbreaks, especially in hot and humid environment. A vaccination program for coliform mastitis is required. You should monitor dry matter and temperature on a daily basis.

Mattresses
Mattresses are the most popular bedding system in robotic milking operations around the world. Their performance depends on proper management, mattress quality and the amount of organic bedding on top. Choose the best option in the market in terms of cushion, traction and support. Always add organic bedding on top in order to balance cow comfort and facilitate surface cleanliness. Adding 2.5 to 10 cm of organic bedding on top will optimize cow comfort and udder health.

Conclusion: organic bedding contains a higher number of bacteria than the ones from mineral material. When using mineral bedding material, the number of teat ends exposed to environmental mastitis pathogens will increase. The use of bedding additives to increase the dryness of the bedding around the udder will limit the growth of bacteria and reduce the concentration of bacteria around teat ends.

Sources: DeLaval and SEGES
Relieve stress

Brushes in barn can reduce mastitis by 30%

Brushes installed in the barn help ensure good cow comfort and relieve stress. Studies show that the installation of a brush led to more than a 30% drop in mastitis cases for second- and higher-lactation cows. The reduction of the number of parasites and organisms on the cow’s coat is another benefit.

Relieve stress

Brushes are also a natural stress reliever, as cows rely on grooming to help overcome stressful situations. Disruptions in cows’ routines leads to stress. Introducing cows to a new pen, or changes in equipment or employees can cause stress. When a cow is stressed, she may behave unpredictably, presenting a danger to workers. If she senses stress at milking, she may avoid entering the parlour, kick off the cluster, or refuse to let down her milk.

Brushes help keep cows cool

During summer, many free stalls and holding areas have a sprinkler system designed to cool cows. However, cows collect dust, dead hair, feed and manure on their backs. When the mist falls on the cows, this creates a crust, holding in heat and preventing it from dissolving. A cow brush removes this material and enables the sprinkler system to do its job. Enhance the cow’s environment pays off.

Brushes are usually seen as a luxury item. However, increasing cow comfort is not just a luxury – it can be seen in your bottom line.

Source: DeLaval
Mastitis is among the top culling reasons for dairy cows. It not only causes pain for the cow, but also results in decreased milk production, the need to discard milk and deal with reduced milk quality for processing. It is not only direct costs like medicine and vet costs that should be considered but also the costs of reduced milk production and discarded milk, increased culling risk and costs and fertility problems. The fatal case of mastitis costs 1,500 - 2,000 EUR per case. Milk loss costs depend on the severity of mastitis. Subclinical mastitis (higher SCC) leads to 10% reduction in milk production. Clinical cases of mastitis leads to up to 20% reduction in milk. Severe cases of mastitis result in up to 100% milk loss. Milk loss and discarded milk account for 46% of total costs of mastitis.

Constant and careful registrations of mastitis cases in the herd are essential to keep the mastitis costs down. Make sure to keep the records for:

- Herd’s average SCC on a yearly basis
- SCC per month during the last year
- Number of mastitis cases during the last year
- Number of mastitis cases per month and quarter during the last year
- Number of mastitis cases depending by lactation (first calvers and later lactation cows) and lactation cycle (early, mid, late and dry period).
Answer these questions based on the records:

- Does mastitis occur in the specific period(s) of the year? (change in feed, climate, environment etc)
- Is high SCC more common for the first calvers in the early lactation?
- Is that the right animals that get treatment for mastitis?

It is crucial to consider critically all treatments, as the studies show that 50% of all mastitis treatments with antibiotics have no effect. The measures taken to prevent mastitis will most likely also reduce other diseases like ketosis and fertility problems – that are important for keeping the costs down. Preventing mastitis and other health problems are the key to success.

Focus your efforts on prevention through optimal management routines and the best suited genetics. Make sure to include Udder health into your breeding goal. According to Interbull lists from April 2018, VikingGenetics countries have the highest genetic level for Udder health for Holstein (102), RDC (101) and Jersey (102) for proven bulls. Especially, for RDC and Jersey the bulls from VikingGenetics outperform all others.

Source: SEGES & Interbull