

HEALTH PROBLEMS IN DAIRY CATTLE

FEATURES

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Genetic selection for high milk production has resulted in the dairy cow becoming a super-production animal. In one lactation a dairy cow can produce 10 to 20 times the amount of milk required to rear a calf and her metabolic rate is 30% higher than that of a beef cow. It must be realised, therefore, that the dairy cow undergoes tremendous physiological stress and is thus susceptible to metabolic problems and various other conditions.

METABOLIC PROBLEMS

Heat Stress

The comfort or thermoneutral zone for dairy cattle is 0–20°C. If the temperature rises above the upper critical temperature, the cattle will experience heat stress and the following adaptations are made by the animal to combat the heat: sweating, respiratory rate increases in an attempt to cool down, metabolism decreases and behavioural changes take place.

Provision of sufficient water and shade are the minimum requirements for combating heat stress. Further measures such as sprayers and fans are used in certain areas at strategic times to cool the cattle down.

Heat stress results in a decrease in the efficiency of the udder's defence mechanism, as well as a decrease in milk production, which can be as high as 40%.

Ketosis

This is a condition that can occur after

calving as a result of low blood sugar levels and high ketone levels (breakdown products of fats) in the blood. Other organs and especially muscles can use ketones as a source of energy, but the brain can only use blood sugar as a source of energy. As a result of the low blood sugar, the animal appears stupid—initially they appear depressed, milk production falls and they lose condition. Later they begin to stumble and walk in circles. Treatment with intravenous glucose and cortisone will relieve the symptoms, but in the long term, the carbohydrate component of the ration must be increased.

Preventative therapy can be applied in the last two weeks before calving, when the energy requirements increase dramatically, due to the rapid increase in the size of the foetus and a decrease in food intake (physical shortage of space in the abdominal cavity). Increasing the energy density of the ration during especially the last 10 days of the dry period is extremely important.

In addition, good nutritional management must be applied by making use of condition assessments at strategic times during the pregnancy to ensure cows are not overfat when ready to calf. Overfat cows (condition score of > 3,75) will burn fat too quickly during the negative energy phase (2 weeks before until 4 weeks after calving) and this will cause malfunctioning of the liver (fatty liver) which is the root of the problem.



Milk Fever

Milk fever is the result of a calcium imbalance, or more specifically a shortage of free calcium in the blood shortly after calving. High producing dairy cattle utilise large amounts of calcium from the blood and the body cannot mobilise sufficient calcium rapidly enough from the bone.

The symptoms usually occur 72 hours after calving. The cow is initially unsteady on her feet, then lies down with her head against her body. If she does not receive a calcium injection she will become comatose. Successive treatments may be necessary.

The main cause of this condition is a cation-anion imbalance in the ration of the dry cow (too alkaline). This can be rectified by acidifying the ration. This will result in an increase in the acidity of the body fluids and calcium (body's own buffer) will be mobilised already in the dry period to rectify the imbalance. The ability of the body to mobilise calcium is actively functioning when the cow calves, which will assist in the calcium being rapidly released from the body's reserves during the start of lactation.

A high calcium ration must not be fed during the dry period otherwise the body becomes "lazy" and is sluggish in mobilising calcium from the body's own reserves.

MASTITIS

Mastitis is still the most im-

portant disease affecting dairy cattle and resulting in reduced milk production. Infection of the teat canal and udder tissue is a result of the intensive conditions under which dairy cattle are kept to provide the high nutritional requirements and milk production.

Clinical mastitis (visible disease symptoms) can be manifested in four different ways:

- Peracute: the cow is extremely sick
- Acute: the cow may appear sick and the udder is clearly abnormal – hot and swollen and the milk shows abnormalities.
- Subacute: the cow appears normal but the milk shows abnormalities.
- Chronic: cows with repeated episodes of subacute or acute mastitis as a result of ineffective treatment or a deep seated infection as in the case of *Staphylococcus aureus* infections.

Subclinical mastitis is where the cow shows no disease symptoms, no abnormalities are visible in the milk, but the cell count is high and there are bacteria in the milk. It is believed that subclinical mastitis is the biggest problem in modern dairies. The problem with this is that there is reduced milk production, it is a source of infectious bacterial organisms and can easily flare up as clinical mastitis.

Aseptic mastitis is where the cell count is high, but there are no bacteria present. This occurs as a result of rough handling of the udder, increased duration of lactation and contamination of milking equipment with chemicals.

Although there is a wide range of mastitis causing bacteria, the most common causative organisms are *Staphylococcus aureus*, *Streptococcus agalactiae* and Gram-negative organisms.



Photo 1: Milk samples from an udder with mastitis. (Photo courtesy of OVI)

Streptococcus agalactiae
This bacterium is specifically adapted to the udder and is highly infectious. It can be introduced into the herd by carrier animals. It spreads by means of the milkers' hands, the teat clusters and the milking machine itself. This organism is susceptible to penicillin and can easily be eradicated by means of the correct treatment and good dairy hygiene.

Staphylococcus aureus

This bacterium is very common in the dairy environment and on the skins of people and animals. It is spread through the herd during the milking process. The infected udder also serves as a source of infection, because the organism penetrates deep into the tissue of the udder, causing microabscesses which are protected against treatment, but which, from time to time, burst open and release organisms into the milk.

Because of the latter, the infections are difficult to treat. Although the organism is usually susceptible to semi-synthetic penicillins (Count-Down LC), resistance in some cases can complicate matters. Problems with *S. aureus* can only really be effectively treated in the dry period with an effective dry cow treatment. Strategic culling of chronically infected cattle and the prevention of new infections are the only methods of solving this problem in the long term.

Gram-negative mastitis

The two main causative organisms are *E. coli* (coliform mastitis) and *Pseudomonas*. Both organisms occur in the environment and flourish under wet conditions. Especially *Pseudomonas* outbreaks can occur when cows stand in muddy dams to drink water.

Gram-negative mastitis usually occurs in high producing dairy cattle when the circumstances are favourable for transfer of organisms from the environment. These organisms cause peracute or acute cases of mastitis shortly after calving, and can lead to rapid death of the cow.

The severe symptoms that are encountered are caused by the toxins that are released by the organisms. Prompt treatment with the correct antibiotic and intravenous fluids can in certain cases save the cow. *Pseudomonas* is more difficult to treat because it is not susceptible to most antibiotics.



Photo 2: A mastitic udder is swollen, red and painful. (Photo courtesy of OVI)

Treatment and Prevention Of Mastitis

The veterinarian plays an important role in the dairy, especially when it comes to mastitis problems. The first priority with mastitis cases is taking milk samples to determine the causative organism by culturing it in the laboratory. At the same time it can be determined in the laboratory, by means of an antibiogram, which antibiotic would be most suitable for treating the infection.

It is important to choose the correct treatment. If a farmer has a problem with *Streptococcus* then it would be sufficient to use one of the older penicillins (Dispovac RX4B). However, if there is a *S. aureus* problem, a newer semi-synthetic penicillin would have to be used (Count-Down LC). The application of intramammary preparations must be done properly. The udder must

first be milked out and the teat opening cleaned with alcohol. Application of the product must be done strictly according to the directions for use on the label and the correct amount of successive treatments given. The withdrawal period for milk must also be adhered to if applicable.

The main reason for re-occurrence of mastitis cases is giving too few treatments, because the milk appearance returns to normal sooner than it takes to kill the bacteria in the udder.

The veterinarian will be able to advise the farmer regarding teat dipping, taking pre-milking samples and other aspects of hygiene in the dairy.

Apart from exercising hygiene practices such as cleaning the dairy and controlling flies and vermin, the farmer must also take into account the importance of cleaning milking equipment, checking the vacuum of the milking equipment and checking the regularly changing rubber components such as on the teat clusters.



Photo 3: Subclinical mastitis can be detected by means of the California Mastitis Test. (Photo courtesy of OVI)

Regular, strategic testing of cows with the California Mastitis Test (CMT) can be a valuable aid for detecting mastitis, especially when cows are going into

dry period (to decide which antibiotic to use) and shortly after calving to detect infections in the early stage and treat timeously.

Usually a somatic cell count of more than 250 000 cells per ml is an indication of a subclinical mastitis problem.

TICKS & TICK-BORNE DISEASES

Tick control is, for various reasons, very important in the dairy. Ticks can cause serious damage to udders, drop in milk production and transmit diseases.

The question that is invariably raised among dairy farmers is which tick control strategy is better: intensive control or tactical control (control when ticks are present on the animals)? Both methods have their advantages and disadvantages. Another question often raised is should the dairy farmer vaccinate against tick-borne diseases?

The biggest danger with low intensity or tactical control in the dairy situation is that it is extremely difficult to maintain immunity against such diseases. There is no way to determine the treatment intervals to maintain a tick challenge to boost the immunity. In addition, if the intervals are too long, the ticks will cause physical damage to the cattle. Due to the fact that dairy cattle undergo so much stress, they are very susceptible to tick-borne diseases.

Intensive treatment without vaccination is the most practical approach, but requires good management and supervision.

Dips that are suitable for lactating dairy cattle must be used. Amitraz (Triatix range of dips or Triatix Cattle Pour-On) and some pyrethroids such as cypermethrin (Ecobash Cattle Dip), cyhalothrin (Coopers ZeroTick Cattle Dip & Spray), deltamethrin (Clout or Decatix 3) or Flumethrin (Coopers Redline Pour-On) are not excreted in the milk. However, the labels of products must be read thoroughly to ensure that they are suitable for use on lactating cattle.

Certain pyrethroids have the advantage that they also control flies, which play an important role in the spread of mastitis. Biting flies transmit diseases such as lumpy skin disease and also cause fly worry with a resultant drop in milk production.

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