

DAIRY MANAGEMENT

COLOPHON:

Veepro Dairy Management is a supplement to the Veepro Magazine. It contains articles, tips and advice aimed at the management of dairy farms worldwide.

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A good start is of crucial importance to a good lactation. A very critical moment in this process is the so-called close-up period that runs from three weeks before calving to two weeks after. Not only is a good start important for the milk production, it also influences health and fertility.

THE LACTATION WELL BEGUN IS HALF DONE

The close-up period

If a dairyman doesn't pay adequate attention to his cows in the weeks prior to calving, he runs a considerable risk of running into problems. Cows can easily become ill, it can be more difficult to get them in-calf, and the milk production may lag behind. The problems often surface (much) later and therefore the cause - too little attention during the close-up period - is not linked to the resulting problem. In addition, there is a negative interaction between diseases, which makes the situation even worse. When a cow goes sick, she weakens and hence is more susceptible to other disorders.

Negative energy balance

A negative energy balance mostly causes the problems. This means the feed requirement and actual feed-intake are not balanced. In such a case a cow does not take in enough feed. Roughage intake almost always is the weak link in this context. On the other hand, if roughage intake is adequate, this is a guarantee for a sufficient energy

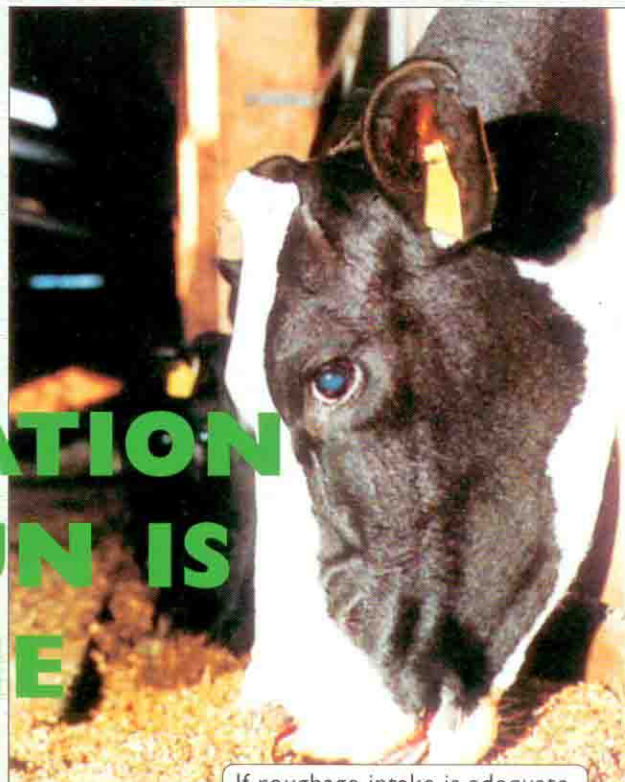
intake, sound rumen action, and a healthy cow. Only if the roughage intake has reached a satisfactory level, concentrates can be added, necessary to compensate for increasingly higher milk productions.

Problems

A bad lactation start may lead to a large number of disorders. These disorders will weaken a cow and will cause her milk production to drop. It is in the farmer's own interest to avoid these problems. The following disorders can be mentioned in this context:

- Fatty liver syndrome
- Milk fever
- Mastitis and too much udder edema
- Afterbirth and uterine infection
- Ketosis
- Rumen acidosis
- Displaced abomasum
- Laminitis
- Fertility problems

This article will only cover the diagnosis and prevention of fatty



If roughage intake is adequate, this is a guarantee for sufficient energy intake, sound rumen action and a healthy cow.

liver syndrome, milk fever, and excessive udder edema. The remaining listed disorders caused by a bad lactation start will be discussed in the next Veepro Magazine.

Fatty liver syndrome

Fatty liver syndrome is the result of the accumulation of body fat in the liver. The problem often surfaces at the end of the dry period, shortly before calving. When a cow doesn't take in enough energy, body fats from the body reserves are being mobilized and the liver has to convert this fat into a directly available source of energy, glucose. Nothing goes wrong if the mobilization of body fat lies at a low level. The liver can handle this. However, when a lot of reserve fat is being used (due to a very negative energy balance), the liver cannot keep pace. This results in a build-up of fat in the liver, which in turn results in the liver not function-



Smell the quality of roughage. Bad quality roughage resulting in a lower feed intake

ing properly. The cow starts to feel less comfortable and starts taking in less feed causing the problem to worsen. The cow is faced with an increasingly larger energy shortage, and starts to use even more reserve body fat that continues to build up in the liver that is already full. The process continues to repeat itself and the effects on the cow are very negative. Adding energy can easily break this self-repeating process. This may be done by administering propylene glycol, by milking the cow (thus relieving the liver since lots of fat are being excreted with the milk), and also by exercising the cow, causing some of the fat to be burned in the muscles. That's why liver fatty syndrome can usually be found with dry cows as the liver has to convert all the mobilized body reserves on its own. The cow cannot lose any fat via her milk, and most dry cows have no exercise since they are held in small pens. It is very important to use the cow's colostrum for the calf's first feedings.

The root of the problem

Fatty liver syndrome mostly occurs at the end of the dry period: the last two to three weeks before calving. In this period, feed intake often lags behind nutrient requirements while the cow specifically needs certain nutrients shortly before calving. Due to a lower feed intake she does not get these nutrients, so a contrary process is taking place actually. Whereas she should be taking in more feed, she is eating less. The dairy farmer should act in time by adding more energy to the ration. In other words, the ration should be improved. Besides the disruption of the feed intake/feed requirement balance, there are more factors that play a role in the occurrence of fatty liver syndrome.

- Cows that are too fat take in less feed. The desired body condition should be 3 to 3.5.
- Bad quality roughage resulting in a lower feed intake.
- Health problems, such as laminitis, resulting in a lower feed intake as well.
- Stress increases fat mobilization and lowers feed intake.

- A high first milk yield increases the energy demand.

Often it is a combination of these factors which leads to fatty liver syndrome.

Prognosis

It is very important to recognize and treat fatty liver syndrome at an early stage, which increases the chances of a quick recovery. A close observation of the cows therefore is crucial.

What are the signs you should be looking for?

- A fall-back in body condition just before calving. This can be recognized by a better body condition in the tail hollows than on the rump. The mobilization starts with muscular fats that you can easily score on the rump.
- Slow eating cows that are slow in their movements and lay down too much.
- A hair coat that doesn't shine and hairs that stand up straight.
- Insufficient rumen fill.
- Urine contains acetones; these are waste products resulting from the fat degrading process. When in doubt, run a urine test to confirm.
- A blood sample may also be drawn for testing the level of nefas (non-estrified fatty acids).
- The smell of acetones near the cow's nose, also a by-product of the fat degrading process.

Acetones can be smelled from a cow's breath



How to run a urine test

Collect a urine sample from the cow that needs to be tested and determine the level of acetones and pH value with a so-called lab-stick. The reaction of the lab-stick may be influenced by ammonia in the barn so run the test outside the barn when in doubt.

Prevention and treatment

Management should always be focused on the prevention of problems. It is important to make sure that close-up cows have the right body condition of 3 to 3.5, that they are in good health and that their ration is

well balanced. House the animals in a separate pen and if possible feed concentrates to each animal on an individual basis. It is not recommendable to keep the close-up cows with the milking herd. They will often be fed too much protein (often resulting in mastitis), the wrong mineral mix, or a ration that is too high on energy. One note: Excessive body condition often begins in the previous lactation.

In addition, make sure to:

- Feed good quality and well-tasting roughage, with more than one-third of the roughage fed being the same as the roughage fed to the milking herd;
- In the third week before calving, feed 1 kg of concentrates per cow per day, in the second week before calving 2 kg, and 3 kg the last week before calving. If necessary feed concentrates (containing degradable starch such as from grains for instance) producing propionic acid. Propionic acid is required to develop the rumen papilla;
- Feed a 14% crude protein ration (where 16% is normal). Make sure to limit the amount of degradable protein as a high amount stimulates the milk production too much;
- Prevent all kinds of stress.

If you do diagnose a cow with fatty liver syndrome, it is important to:

- Take away the source, if possible;
- Administer propylene glycol.

If this does not help:

- Milk the cow to free the liver of excess fat;
- Give the cow exercise.

Often it is difficult to successfully treat a cow with fatty liver syndrome in time, especially when they have been suffering from the syndrome for some time. Around calving these cows are extremely vulnerable and therefore require much care and attention. The costs of these extra efforts will always be made back at a later stage.



MILK FEVER AND EXCESS UDDER EDEMA

As there is a close interaction between milk fever and excess edema, these two disorders will be discussed simultaneously.

Milk fever is caused by a low level of calcium (Ca) in the blood. A shortage of magnesium (Mg) also plays a role. Calcium influences the transport of nerve pulses. When there is a shortage, a cow first becomes weak and cold, and in a later stage is unable to stand up. Take note that there is both a clinical and a sub-clinical form a calcium shortage. In the clinical variant, a cow cannot stand up anymore and is very cold. With the sub-clinical variant the symptoms are not as clear: the cow is a little cold, does not stand firmly on her feet, calving goes very slowly, the after-birth does not come off or much later, and she does not take in enough feed.

Excess udder edema is caused by a body fluid imbalance in the cow, a cow holds on to too much body fluid. A two-year-old is more susceptible to this than a mature cow. This is due to the fact that the lymph glands that drain the fluids are not as well developed in a two-year-old, resulting in excess edema.

An animal with excess edema doesn't milk out well due to congestion and pain in the teats. Shortly after milking they often will let down the milk, which makes the animals very susceptible to mastitis. In addition the udder, and especially the median suspensory ligament, is strained by edema (leading to broken udders). With their bloated and large udders, the animals don't feel comfortable. They don't move about freely and don't dare to lie down, especially not in free-stall barns. This results in stress and a lower feed intake.

Prevention and treatment

Milk fever. A cow gets her calcium requirement from the ration and from body reserves (bones). Around the calving time, the intake from the ration will be too low to compensate for the increased calcium demand. This means she will need to mobilize calcium from her bones. Mobilization requires a so-called mobilization hormone that is synthesized in the adrenal gland. However, this hormone is inactivated when the calcium balance is positive thanks to the calcium supply in the ration. It takes about a week for the hormone to be activated and this is too long a period to mobilize sufficient calcium around calving.

In order to prevent milk fever, it is important to feed a dry cow a ration that is low on calcium, in order to keep the mobilization hormone active. It is no problem to

feed extra calcium during the last days before calving as this does not affect the mobilization hormone. If the cow does go down with milk fever, she should be administered a calcium/magnesium solution as soon as possible, and this should be repeated if necessary. A Ca-drench or powder may also be administered to **prevent** any such problems.

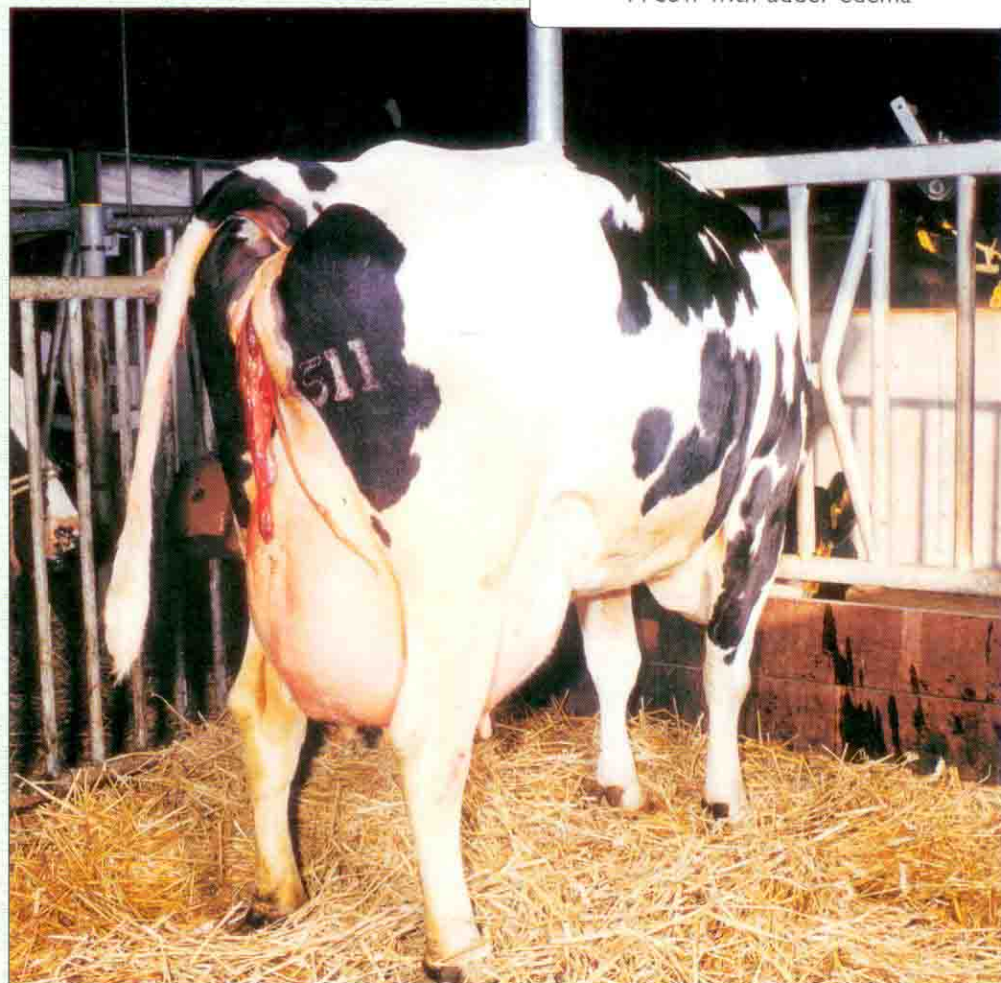
Udder edema. A complicated process of negative ions (anions) and positive ions (cations) plays an important role in the formation of udder edema. The cow should have a correct cation/anion balance (CAB). The CAB influences the body acidity (pH). In addition, excess protein, and specifically degradable protein, increases the body pH. The body pH can be measured through a blood or a urine test. It should be around 7 to 7.5.

If the pH goes over 7.5 due to too much potassium (K⁺) or salt (sodium = Na⁺), the animal will hold on to body fluid around calving. If the pH drops below 7, the cow will try to rebalance it by excreting excess

chlorine (Cl⁻) and sulphur (S⁻) via the urine. As a result, the amount of fluid and edema in the body is lowered. This is what we call the diuretic effect.

A positive side effect of a low pH is that Calcium goes with it, causing the cow to sense a shortage of calcium, which activates the mobilization hormone. The cow will hence be less susceptible to milk fever. A lower pH is also responsible for a smaller first colostrum, which has the advantage of a lower energy requirement, a lower calcium requirement, and a much better colostrum quality. Shortly after calving the pH should return to normal levels, otherwise milk production will be inhibited. When trying to influence the pH value, roughage is the first point of attention. Make sure the ration for close-up cows contains feeds that are low on K⁺ and Na⁺ and don't contain too much degradable protein. Check body pH through urine testing and monitor cows for excess edema. Adjustments can be made with anionic salts (containing Cl⁻ and S²⁻) or 2% diluted hydrochloric acid. Feed intake is negatively influenced by the use of diluted hydrochloric acid though, as it affects the ration's tastiness. Start using it in time to allow cows to get used to it.

A cow with udder edema



SUMMARY

Make sure that close-up cows are managed as follows:

1. Make sure that cows enter the dry period with the right body condition;
2. Provide a ration that is low on calcium at the start of the dry period;
3. In the last two to three weeks of the dry period, lower the urine pH to 6 or to at least lower than 7;
4. Start adding energy to the ration in time;

grain



5. Stimulate the development of rumen papilla by adding feed (such as grains) that stimulates the formation of propionic acid;
6. Prevent stress;

conditiescore 3



conditiescore 3,5



7. Keep the cows healthy and in the right body condition (condition score 3 to 3.5);
8. Make sure the feet & legs are healthy;
9. Aim for a maximum intake of roughage with plenty of fiber to stimulate rumen activity;



luzern stimulates

10. Monitor and observe cows daily;
11. Implementation of these practices may depend on local circumstances.

MONITORING THE COW

