# Caring for your cows after calving – are they fit for the next lactation?

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Calving is an important event both for the cow and for the farmer. For the farmer, depending on his management, it can mean a financial benefit (a new calf for breeding or fattening) but also financial losses because of:

- Reduction of milk yield due to a bad constitution of the cow at the beginning of the new lactation.
- High treatment costs in case of milk fever, one of the most established problems after calving.
- Loss of the cow in the worst case.

Statistically, approximately 60% of all additional costs and losses in dairy farming appear in a period of four weeks around calving.

For the cow this period and the calving presents an enormous stress situation and strain on the cardiovascular system. The organism, which is already weakened by high losses of fluids and electrolytes (amniotic fluid) for the following lactation has to switch to a higher – in case of high yielders 3-fold – level of metabolism than during the dry period.

To guarantee that the cow stays healthy and for a good start into the following lactation, the following points should be respected:

- Compensation of the losses of liquids and electrolytes.
- Adequate charge of the rumen.
- Milk fever prophylaxis.

## Compensation of losses

The loss of liquid could be compensated by an offer of drinking water – the cow has to drink between 20-80 litres after calving. For the loss of minerals and vitamins a special drink should be offered. A palatable drink with ingredients like vitamins and trace elements, which stimulate water intake and helps the organism to regenerate quickly, would be the ideal solution.

Due to its palatability LaktaStart Calving drink increases water intake and compensates losses with its content of vitamins, trace elements and electrolytes in a high bioavailable form. With its easy handling – the bottle is only emptied into the drinking water – LaktaStart Calving drink has a distinct advantage compared to competitive products currently on the market. It is liquid and packaged in single dosages – that means that dosing, stirring and package leftovers do not apply.

## Adequate rumen filling

Around calving, feed intake of dairy cows decreases and the rumen is only charged partly. In combination with the decreased volume because of calving there is a lot of space in the body of the dairy cow.

Under bad conditions this can lead to a displacement of the abomasum. An adequate filling of the rumen by drinking enough water after calving can prevent this displacement of the abomasum.

Furthermore, a 'positive reaction chain' is initiated. Stimulating the rumen by filling influences feed intake in a positive way. Higher feed intake leads to higher intake of energy, electrolytes, minerals and vitamins and the cow is well prepared for the following lactation.

On a farm with 350 Holstein-Friesian cows in total, a trial was conducted with 26 cows to test the effects of LaktaStart Calving drink. The control group (n=13) got pure water, the trial group (n=13) water with LaktaStart Calving drink.

All animals in the trial passed at least the second lactation and were homogenous concerning health and level of performance. In none of the groups were the cows treated prophylactically for milk fever.

The results concerning the criteria water intake, incidence of displacement of the abomasum, milk fever, time passing until the placenta is expelled and milk yield after seven and 14 days, are shown in Table 1.

Due to a better taste of the drink, a higher intake of water fills the rumen and therefore prevents a displacement of the abomasum. The cow can replenish the needed electrolytes, vitamins and trace elements. The better constitution decreases the incidence of placental retention, mastitis, milk fever and results in a higher milk yield in the starting lactation.

***Table 1. Trial results.***

| | Control group (n=13) | Trial group (n=13) |
|---|---|---|
| Water intake after calving (litres) | 10.85 | 22.00 |
| Percentage of animals with displacement of the abomasum (%) | 23.08 | 0.00 |
| Percentage of cows with milk fever (clinically manifest) (%) | 23.08 | 0.00 |
| Time until expulsion of the placenta (hours) | 16.31 | 11.08 |
| Milk yield after 7 days (litres) | 24.04 | 29.31 |
| Milk yield after 14 days (litres) | 27.85 | 36.62 |

## Milk fever

Beside the general after effects of calving the cow has the risk of a serious disease. Milk fever is a dysfunction of the calcium and phosphorous metabolism and normally breaks out during the first 48 hours after calving. During the dry period the cow's need for calcium is relatively low. If the content of this mineral however is too high in the ration during this period (operationally unavoidable, high content of calcium, for example in silage of grass), the mechanisms for Ca-absorption out of the feed and the mobilisation out of the bones are not 'trained'.

At calving, these mechanisms have to be got up to speed quickly. This is because ,for the production of colostrum, high amounts of calcium (2.3g/l) but also phosphorous (1g/l) are needed very fast.

Calcium, for example, should be absorbed increasingly from the feed or mobilised out of the bones.

However, the mechanisms for Ca-mobilisation especially in older animals, do not react fast enough and the supplies from feed and bones are not sufficient. That means calcium is drawn from muscle tissue. This results in a functional disorder of the muscle tissue (crippling) and the reduction of nervous impulses.

The low Ca-level keeps secretion of hormones of the parathyroid high, which prevents the reduction of excretion of phosphorous via the urine and saliva. However, this is imperative in case of high demand.

Therefore, acute deficiency of phosphorous is inevitable. This low level of phosphorous in the blood can be compensated with an adequate supply of highly available phosphorous within a short time.

The clinical form of milk fever begins (1st phase, <1h) with amyostasia, stiff motion, restless-

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ness, inappetence, cardiac flutter, and slightly higher temperature. This phase is often not recognised (like the subclinical form). During the second phase (1-12h) downer cow syndrome, paralysis of the skeletal muscles, teeth grinding, quick and weak pulse, cold surface of the body, dilated pupils and bloat appear.

Then, during the third phase, the cow lies down on her side, gradually passes out and lapses into coma.

Untreated, phase three with strong bloat, breathing dysfunctions and a weak and fast pulse leads to death within a few hours (average mortality in dairy farms today 2-5%, in individual cases also up to 50%).

Whereas the serious form of milk fever is easy to identify from the second phase (on average incidence 8-10%) and can be treated accordingly, the negative consequences of a slight (subclinical) deficiency of calcium – in approximately 30% of the cows – are often underestimated.

The animals reduce their feed intake; the negative energy and protein-balance worsens. The cows do not regain their momentum.

Further on, due to a general impairment of the muscle tissue, udder problems (mastitis due to reduced smooth muscle function in the teat sphincter) and in the gastrointestinal tract arise. Reduced ability of smooth and skeletal muscle contraction leads to tedious labour with diverse consequences (see Fig. 3).

Milk fever or parturient paresis is always combined with a higher level of cortisone in the blood. This decreases immunological defence and facilitates the occurrence of infections like mastitis, endometritis and infections of the hooves.

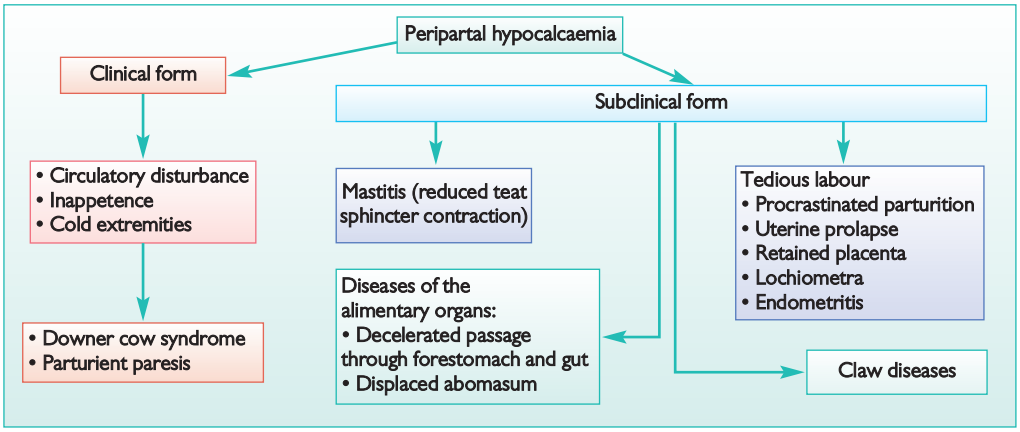


***Fig. 3. Consequences of a peripartal hypocalcaemia in the dairy cow (Durst, 2006; according to Rothert, 1998).***

## Breed susceptibility

Dairy breeds (Holstein-Friesian) are more vulnerable to milk fever, because more calcium is needed for higher milk production.

Age is a critical factor (Fig. 4). Cows with their first lactation are rarely affected, with growing age, however, the risk increases, because milk yield is higher. The number of receptors on the gut cells, which are responsible for the binding of 1,25-$(OH)_2$-Vit $D_3$ decreases. This binding is important for the transport of calcium through the gut cells. The number of osteoblasts on the surface of the bones, which possess receptors for 1,25-$(OH)_2$-Vit $D_3$ and parathormone is also reduced. This results in an impeded mobilisation of calcium out of the bones so that the quantity of fast mobilised calcium is reduced in these animals.

To stimulate the active regulatory mechanisms of the calcium metabolism the following points should be observed:

- 3-4 days before parturition the content of calcium in the ration should be reduced. In practice, however, it normally fails because of the high Ca-content of forage (for example feeding with a high amount of grass silage) which is used on the farm.
- An oversupply of energy and protein should be avoided during the dry period.
- Buffers for the rumen should not be fed during the dry period, because they worsen the alkalinity situation of metabolism just before parturition.
- A dosage of vitamin $D_3$ should be given during the last period of pregnancy, too late or a too early application can seriously affect the Ca-balance of the cow.

On farms where these preventive measurements operationally are not taken or are not possible, or for animals which are susceptible because of predisposing factors like age, breed, antecedent, oral dosage of calcium is the preferred method for prevention. Better yet is the combination of calcium and phosphorous (such as Calz-o-Phos from Agrochemica/ EW Nutrition with a very good Ca:P-ratio of 2:1,5). A further plus factor is the fact that this product does not contain calcium chloride, which carries the danger of the chemical burn of the mucosa.

## Summary

High losses of liquids are one of the factors which make calving a stressful period for the cow. The cow should be given a palatable drink to induce an adequate intake of liquid, electrolytes and minerals after calving. With this measure losses can be compensated and a displacement of the abomasum can be prevented.

The danger of milk fever is minimised by adequate handling during the dry period. For older cows, high yield breeds and if the preventive measurements operationally are not feasible, a supplement should be applied, which contains calcium and phosphorous in an optimal ratio and in an adequate concentration. ■

*References are available from the author on request*

***Fig. 2. Regulation of Ca-metabolism (according to Hess and Rérat, 2007).***

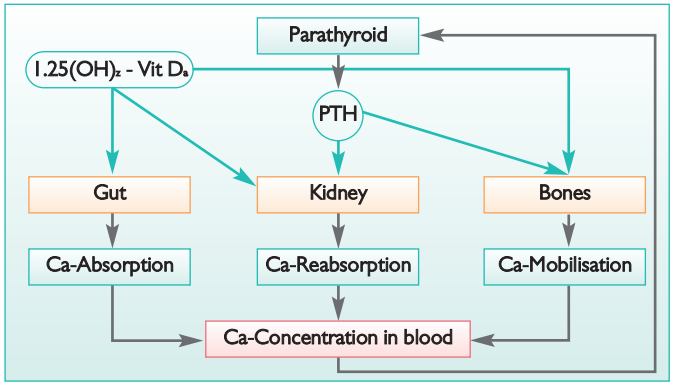


***Fig. 4. Frequency (%) of downer cow syndrome in correlation with the number of lactations (Metzner and Klee, 2005).***