



Preventive Measures of Metabolic Diseases in Dairy Cows

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ABSTRACT

Metabolic disorders are a key problem in the transition period of dairy cows as the cow suffers from negative energy balance due to low dry matter intake. Main challenge and problem appears to be adaptation of rumen at different physiological stages, which leads to onset of various metabolic diseases. Nutrition plays a pivotal role in preventing metabolic disorders post calving and through lactation. Metabolic disorders such as ketosis, downer cow syndrome, hypocalcaemia etc can have a significant effect not only on a cow's lactation performance, but also on fertility performance. These types of problems tend to be associated with higher yielding animals, which are controllable by good feeding practice, both in lactation and during the dry period. So an understanding and day to day update of these metabolic diseases becomes essential and critical for successful venture of dairy farm.

Keywords- Metabolic disorders, nutrition, lactation, dry period

INTRODUCTION:

Among domestic farm animals, the metabolic diseases achieve their greatest importance in dairy cows. The common metabolic problems of early lactation, milk fever, and ketosis, are really management diseases. At the herd level, disease does or does not occur as a function of how cows are fed and handled during the late dry period and during transition to the nutrient-dense rations needed to support high milk production in early lactation. Feeding management includes sources, storage, preparation, ration formulation, delivery, and access. Good feeding management must be coupled with providing an environment as comfortable as possible to facilitate maximal feed consumption. Individual cows may be predisposed to metabolic

problems/ production diseases as a result of improper body conditioning, concurrent illness, genetics, and any other events that may decrease dry matter intake (DMI).

The term 'production diseases' or metabolic diseases are an imbalance between the rates of 'input' of dietary nutrients and the 'output' of production. When the imbalance is maintained, it may lead to a change in the amount of the body reserves of certain metabolites or their 'throughput' and sufficiently large changes in 'throughput' will give rise to signs of production diseases. Adequacy of the diet if cows expected to produce a certain quantity of milk or return to estrus within a desirable length of time following parturition.

1. PARTURIENT PARESIS/ MILK FEVER

Parturient paresis is a metabolic disease occurring most commonly about the time of parturition in adult female and is characterized by hypocalcaemia, general weakness, circulatory collapse and depression of consciousness.



Treatment:

1. The standard treatment of parturient paresis is intravenous administration of calcium borogluconate 400-800 ml of a 25% solution.
2. Administration of glucose 500ml of a 40% solution , sodium acid phosphate 200ml of a 15% solution and magnesium sulfate at 200-400ml of 15% solution.
3. Udder inflation is a valuable alternative treatment in cows which do not respond completely to the initial treatment.
4. Oral administration of gels containing calcium chloride to increase the recovery rate and to prevent relapse.

General nursing procedure:

1. If the cow is down for long period, she should be moved from side to side 3 to 4 times a day and the legs and bony prominence are massaged.
2. If recumbent for more than 48 hrs she should be raised in a hip sling several times daily.

Preventive Measures:

1. Maintenance of appetite and avoidance of alimentary stasis in late pregnancy appear to be an important preventive measure.
2. Feeding of high calcium diet before calving is contra-indicated and may increase the incidence of milk fever especially if the diet is alkaline, Feeding of an acid type diet or a low calcium diet for the last 5 weeks of pregnancy is practiced as control measures.

Management practices:

1. Avoid excessive calcium intake during dry period.
2. Feed adequate phosphorus to meet requirements or limit calcium intake to more than 100-125g/day/
3. Avoid overeating by either reducing energy concentrates of the ration or restricting the intake during prepartum period.
4. Avoid stress at the time of parturition.
5. At calving the cow should receive an oral dose of calcium gel followed by diet with a high calcium

Calcium gel dosing: 150g of calcium salt given by drench or in the feed in 3 doses are given 24 hrs before, 1-2 hrs before and 10-14 after calving is one of the best.

Preventive measures: Vitamin D and its metabolites and analogs:

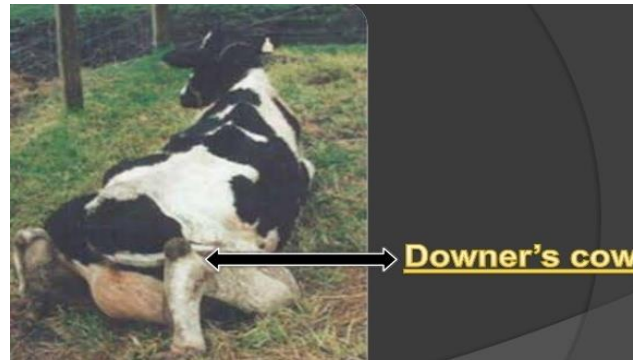
1. Single dose of Vitamin D₃ 10 million units intramuscularly given 2-8 days before parturition is the most popular prophylaxis milk fever.
2. Oral dosing with 20 million units vitamin D₂ daily for 5 days to cows immediately prior to calving reduces the incidence of the disease.
3. 25-Hydroxychole calciferol at a dose rate of 8mg, 3-10 days before calving repeated at weekly intervals.
4. 1,24 dihydroxy vitamin D₃ 200mg/day orally, reduce the incidence.

Miscellaneous prophylactic measures:

1. Ammonium chloride is fed with grain 25-100 g/day during last few weeks of pregnancy to produce acidosis and enhance calcium mobilization and ionization to prevent milk fever.
2. Cows should not be subjected to unnecessary exercise or excitement.
3. Good plane of nutrition during the pregnancy and gradual changes to lush pasture.

2. DOWNER COW SYNDROME

The downer cow syndrome is a condition which occurs in cattle following hypocalcemic parturient paresis and is characterized clinically by prolonged recumbency even after two successive treatments of calcium.



Treatments:

1. Injection of magnesium salts phosphates, corticosteroids stimulant tonics and vitamin E and selenium.
2. Fluid therapy by oral or parenteral route is indicated to cows which may not be drinking a normal amount of water.
3. Comfortable bedding and turning the cow from side to side several times to minimize the degree of ischemia necrosis and pare analgesia.
4. Physiotherapy in the form of muscle massage to restore the normal muscle activity in the affected limbs.

Preventive Measures:

Cows should be treated during the first stage of parturient paresis before they become recumbent. Once recumbent, they should be treated as soon as possible and cows should be well bedded with liberal quantities of straw frequent rolling of cows from one side to another on hourly basis.

3. LACTATION TETANY (HYPOMAGNESEMIC TETANY, GRASS TETANY)

Lactation tetany is a highly fatal disease of all of ruminants and has the highest incidence in lactating cows. It is characterized by hypomagnesemia and usually hypocalcemia and clinically by tonic-clonic muscular spasms and convulsions and death due to respiratory failure.



Treatment:

1. **Combination of calcium – magnesium** preparation 500 ml of a solution containing 25% calcium borogluconate and 5% hypophosphite solution of magnesium salt, magnesium lactate, or magnesium gluconate 15% solution 200-400 ml.
2. **Feeding of magnesium** rich supplement is recommended after parenteral.
3. **Intramuscular injection of an ataractic drug** before commencing specific treatment to control convulsions in acute cases.

Preventive Measures:

1. Feeding of magnesium supplement: Daily feeding of 120g of magnesium oxide, magnesium phosphate (53g/day).
2. Heavy magnesium bullets: Place a heavy bullet of magnesium in the reticulum, which constantly liberates small amounts of magnesium about 1 gm daily.
3. Top dressing of pasture: Calcined magnesia (1125 kg/ha) or magnesia limestone (5500 kg/ha) are used.
4. Spraying pasture with a 25% solution of magnesium sulphate at fortnightly intervals.
5. Provision of shelter in an area where winter pasturing is practiced.
6. Time of calving: incidence is high during cold winter months.
7. Feeding of hay and unimproved pasture: Provision of some grain or rough grazing reduce the incidence.

4. KETOSIS OF RUMINANTS (ACETONEMIA OF CATTLE)

Ketosis in ruminants is a disease caused by impaired metabolism of carbohydrate and volatile fatty acids. Biochemically it is characterized by ketonemia, ketonuria, hypoglycemia and low levels of hepatic glycogen.

An over conditioned, fresh cow with ketosis



Treatment:

1. Intravenous injection of 500 ml of a 50% solution of dextrose.
2. Propylene glycol or glycerin (225 gm twice daily for 2 days followed by 110 g daily for 2 days) can be administered as a drench in the field.
3. Ammonium lactate 300g, daily for 5 days in repeated doses to be effective.

Hormonal therapy:

Anabolic steroids 30 mg followed by oral propylene glycol (100ml; twice daily). Dexamethasone-25 mg

Miscellaneous treatment:

1. Chloral hydrate: initial does of 30 g orally followed by 7 g twice daily for several days.
2. Vitamin B12 and cobalt 750 mg 3 doses at 1-3 days intervals.
2. Addition of nicotinic acid in the feed (12 g daily).

Preventive Measures:

1. Adequate caloric intake should be ensured.
2. Use silage or hay as maintenance ration supplemented with 1Kg/day concentrate and gradually increased to 5 Kg daily at calving time.
3. After calving, the concentrate ration should be increased gradually (3Kg/100Kg body weight for maintenance and 1Kg/3Kg milk).
4. Provide good quality and ground maize.
5. Adequate exercise
6. Ration must contain adequate cobalt, phosphorus and iodine
7. 110g of sodium phosphate daily for 6 weeks commencing at calving or propylene glycol (350 ml daily).

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