

Bihar Animal Sciences University, Patna

Department of Animal Nutrition

Course No. ANN-607

Topic: Metabolic Disorders-I

Date: 30.12.2020

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Introduction:

- Disturbance of one or more metabolic processes related to regulation of certain metabolite in body fluids.
- Affects energy production or damages tissue.
- May be inherited or acquired (more common).
- **The cascade of metabolic disorders occurs in a predictable fashion.**

Metabolic disorders in ruminants:

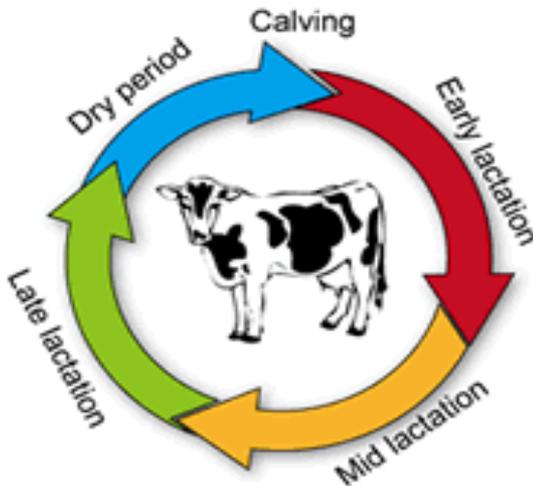
In ruminants, the metabolic disorders generally occurs during **“TRANSITION PHASE”**



About three weeks before and after parturition

Can be divided into-

- Late lactation
- Dry period
- Parturition
- Early lactation



FACTORS WHICH PREDISPOSES AN ANIMAL TO METABOLIC DISORDER-

Hormonal
changes around
parturition

Abrupt
change of
diet

Negative
energy
balance

Non lactating to
lactating stage

Drainage of
minerals

Some common metabolic disorders

- **Milk fever**
- **Ketosis**
- **Grass tetany**
- **Ruminal acidosis**
- **Downer cow syndrome**
- **Fatty liver syndrome**
- **Bloat**
- **Retained placenta**
- **Laminitis**
- **Displaced abomasum**

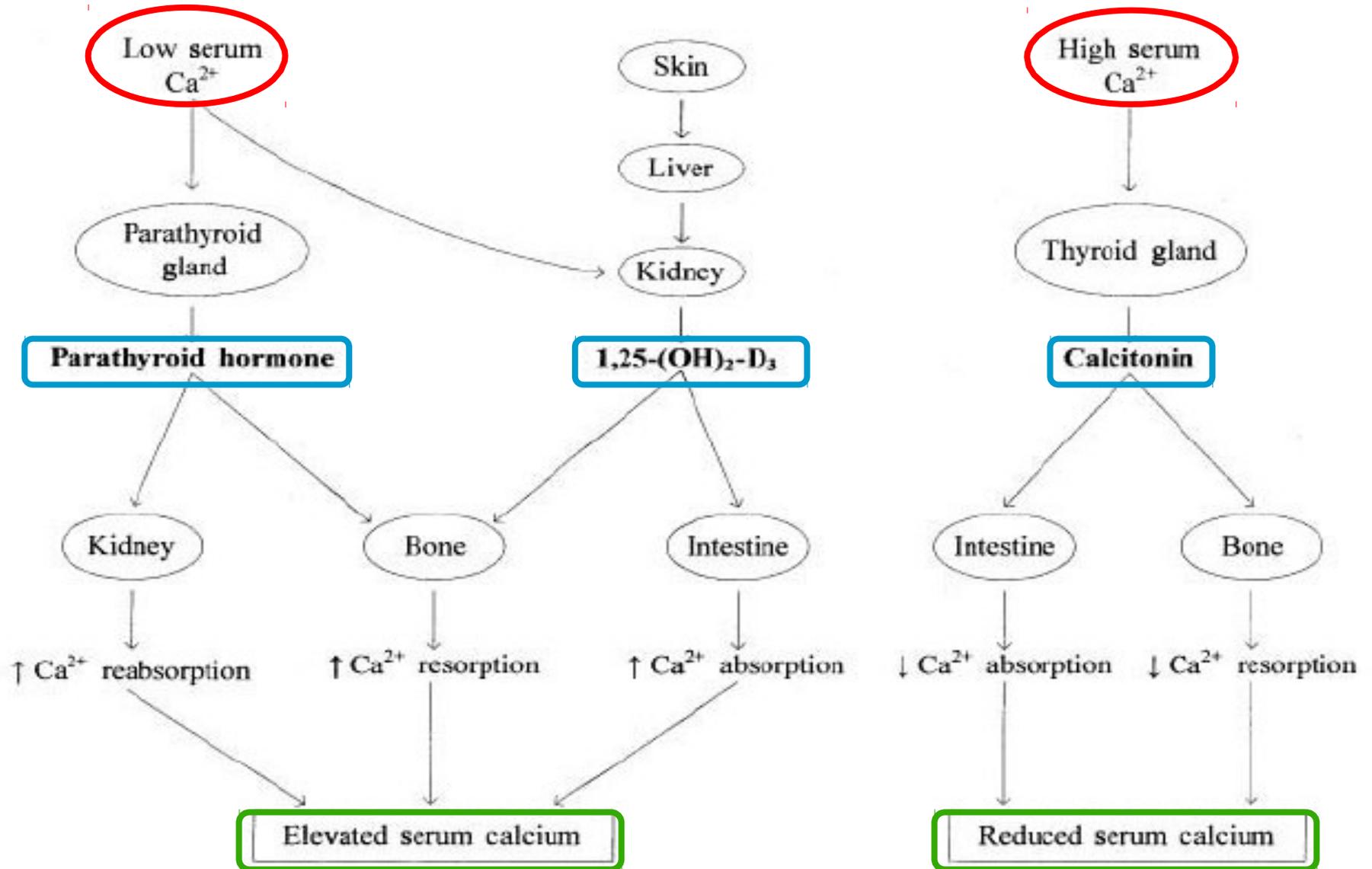
MILK FEVER

- **Synonym**-Parturient paresis, hypocalcemia
- Afebrile metabolic disorder of high yielders or mature dairy cattle and buffaloes.
- Heifers-rarely affected;
- Older cows increase in susceptibility upto fifth or sixth calving.
- **Etiology**-
 - Hypocalcemia due to sudden increase in Ca requirement for colostrum and milk production.

Predisposing factors-

- Increased estrogen level around parturition-inhibits Ca mobilisation
- Older cows are unable to mobilize Ca from bones.
- Feeding of high K/Na diet-leads to metabolic alkalosis-inhibits Ca resorption.
- Increased Ca intake during dry periods-reduces parathyroid activity.
- Low magnesium diets(Mg necessary for appropriate PTH secretion).

Hormonal regulation of calcium homeostasis



MILK FEVER : causes

- Low level of ionized calcium in tissue fluids.
- Excessive drainage of calcium in the milk just after parturition.
- Excessive loss of calcium in the colostrum beyond the capacity of absorption from the intestine and mobilization from the bones to replace.
- An impairment of absorption of calcium from the intestine at parturition.
- Deficiency of Vit. D and less acidic pH in gut.
- Improper mobilization of calcium from the skeleton.
- Hypophosphataemia and hypomagnesaemia.
 - Mg necessary for appropriate PTH secretion.
- Sudden deprivation of food
- **Grazing on oxalate** containing feed

Characteristic symptom-

Cows appear in recumbent state with it's head on flank(S-shaped).

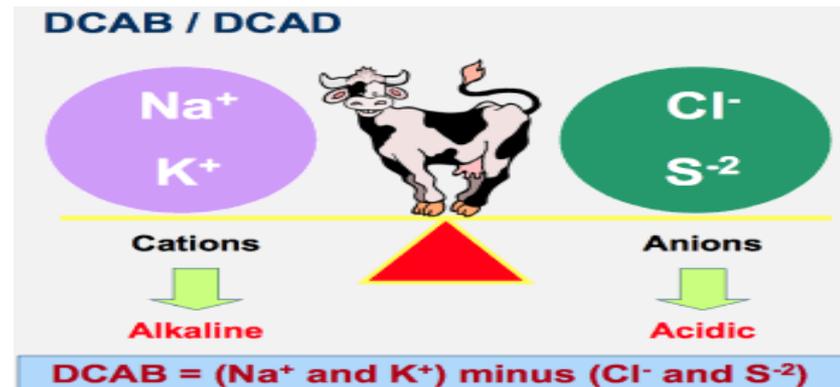


Figure 1. Cow in sternal recumbency.

Source: Kimura et al. 2006

Preventive measures

1. Feeding low Ca diet around calving-increases parathyroid activity and synthesis of 1,25-dihydroxy vitamin D₃.
2. Feeding acidifying rations.
3. Oral drenching around calving with Ca supplementation .
4. Vitamin D₃ administration 2-8 days before calving.
5. Feeding diet low in potassium(corn silage, distiller's grain).



A top-down view of a wooden-framed chalkboard with the words "Thank You" written in white chalk. The chalkboard is centered on a wooden surface. To the left is a red rotary telephone, to the top right is a green plant, and to the right is a black typewriter.

Thank
You