



# Feeding management in the prevention of production diseases

**Dr.A.Bharathidhasan, M.V.Sc., Ph.D.,**

Associate Professor and Section Head,  
Rabbit Breeding Unit,  
Post Graduate Research Institute in Animal Sciences,  
Kattpakkam, Tamil Nadu.

# Feeding Management in The Prevention of Production Diseases



## OBJECTIVE

- ▶ To impart the knowledge on feeding management in prevention of production diseases

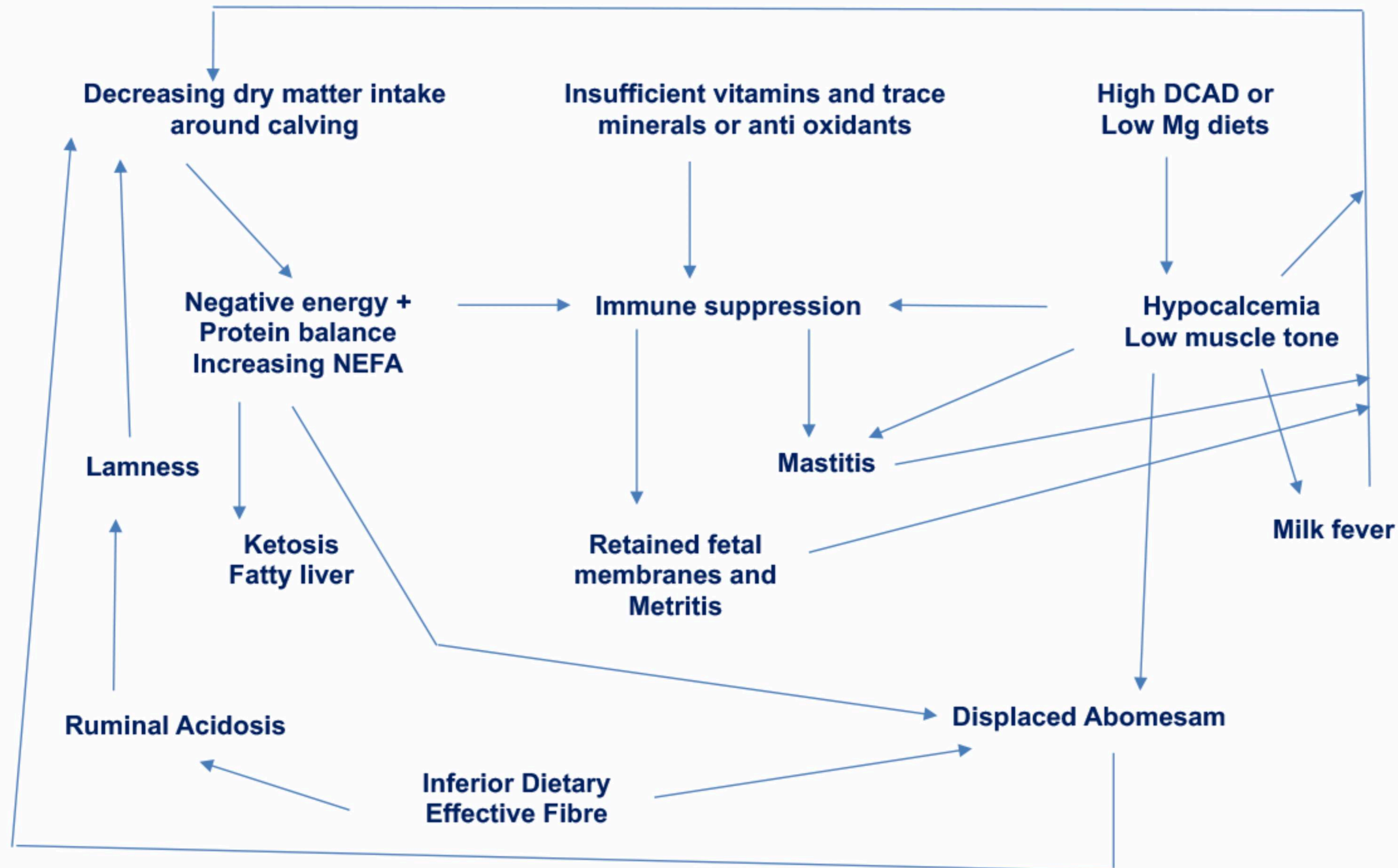
# Production Diseases

- ▶ Related to disturbance of one or more metabolic process in animals.
- ▶ Particularly during and after parturition
- ▶ Hormonal change
- ▶ Moving from non lactating to lactating animals
- ▶ Roughage to high concentrate diet
- ▶ Major drop in feed intake
- ▶ One in 2 dairy cows are prone for metabolic diseases





# Production Diseases





# Production Diseases

- ▶ Milk fever
- ▶ Ketosis
- ▶ Grass tetany
- ▶ Sub acute ruminal acidosis (SARA)
- ▶ Laminitis
- ▶ Fatty liver
- ▶ Downer cow syndrome
- ▶ Post parturient Haemoglobinurea
- ▶ Left displacement of abomasum (LDA)
- ▶ Bloat
- ▶ Retained fetal membrane (RFM)
- ▶ Liver abscesses
- ▶ Udder edema
- ▶ Mastitis
- ▶ Metritis



## 1. MILK FEVER (Hypocalcemia / Parturient paresis)

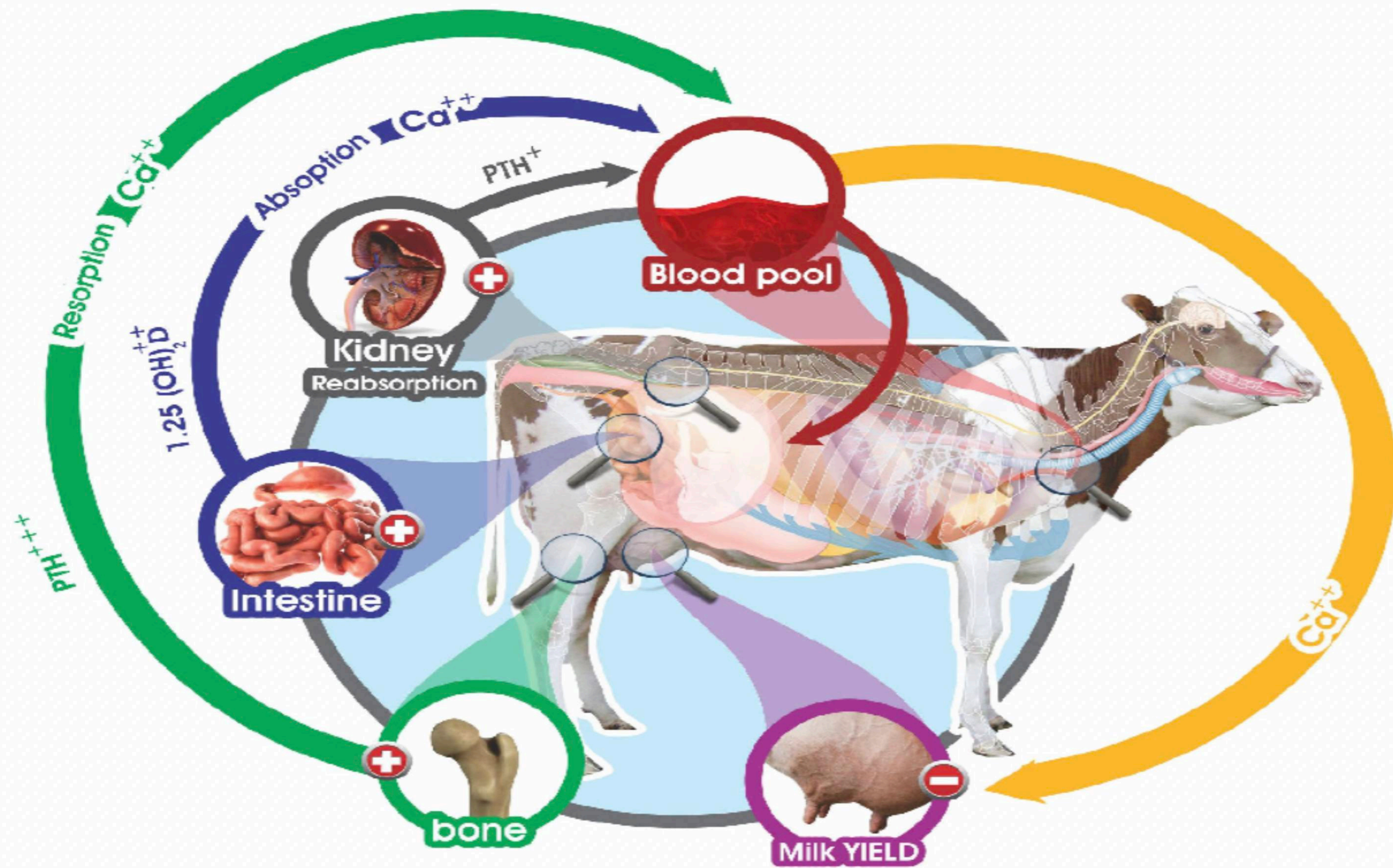
- ▶ **Caused by a large calcium (Ca) demand, Occurs within 24 hrs of calving.**
- ▶ **Unable to meet the Ca demand at the onset of milk production**
- ▶ **Ca level in blood < 5 mg/dl**
- ▶ **Weakness, recumbency, shock, paralysis, circulatory collapse, coma and death**
- ▶ **6% incidence rate in dairy cattle; Incidence increases with milk production and age**
- ▶ **Sub clinical hypocalcemia can affect 50% of dairy cows leads to:**
  - **Decreased dry matter intake**
  - **Ketosis**
  - **Retained placenta**
  - **RFM**
  - **Decreased reproductive efficiency**
  - **Decreased milk production**

# Causes

- ▶ **Ca deficiency is due to severe outflow of Ca during initial milk production**
- ▶ **Calcium interacts with other minerals in the blood**
  - **Incidence may be influenced by levels of:**
    - ▶ **Mg, K, P and estrogen levels**
  - **Acid-base balance**
    - ▶ **Imbalances high risk for milk fever.**
    - ▶ **High alkaline environment hinders the mobilization of Ca from bone and absorption of Ca from intestine.**
    - ▶ **Inhibit parathyroid glands and renal synthesis of Vit D which restricts blood Ca levels**
- ▶ **Feeding high Ca diets prior to parturition**
  - **Cow doesn't adapt to mobilizing own Ca reserves**



# Calcium Homeostasis





# Clinical Signs

## ▶ Stage I – Standing

- ▶ Hypertensive, weakness, anorexic, hypersensitive, shaking of head, protrusion of tongue and grinding of teeth
- ▶ Prodromal stage- anorexia, agalactia, rumen stasis, scanty feces, normal temp, heart and respiratory rate



# Clinical Signs

## ▶ Stage II – Sternal recumbency

- ▶ Flaccid paralysis, lying on sternum, depression, small muscle tremors, low body temp, cold extremities, muffled heart beat, bloat, dilated pupils, lateral kink of head, subnormal temp 36-38° C and Dry muzzle





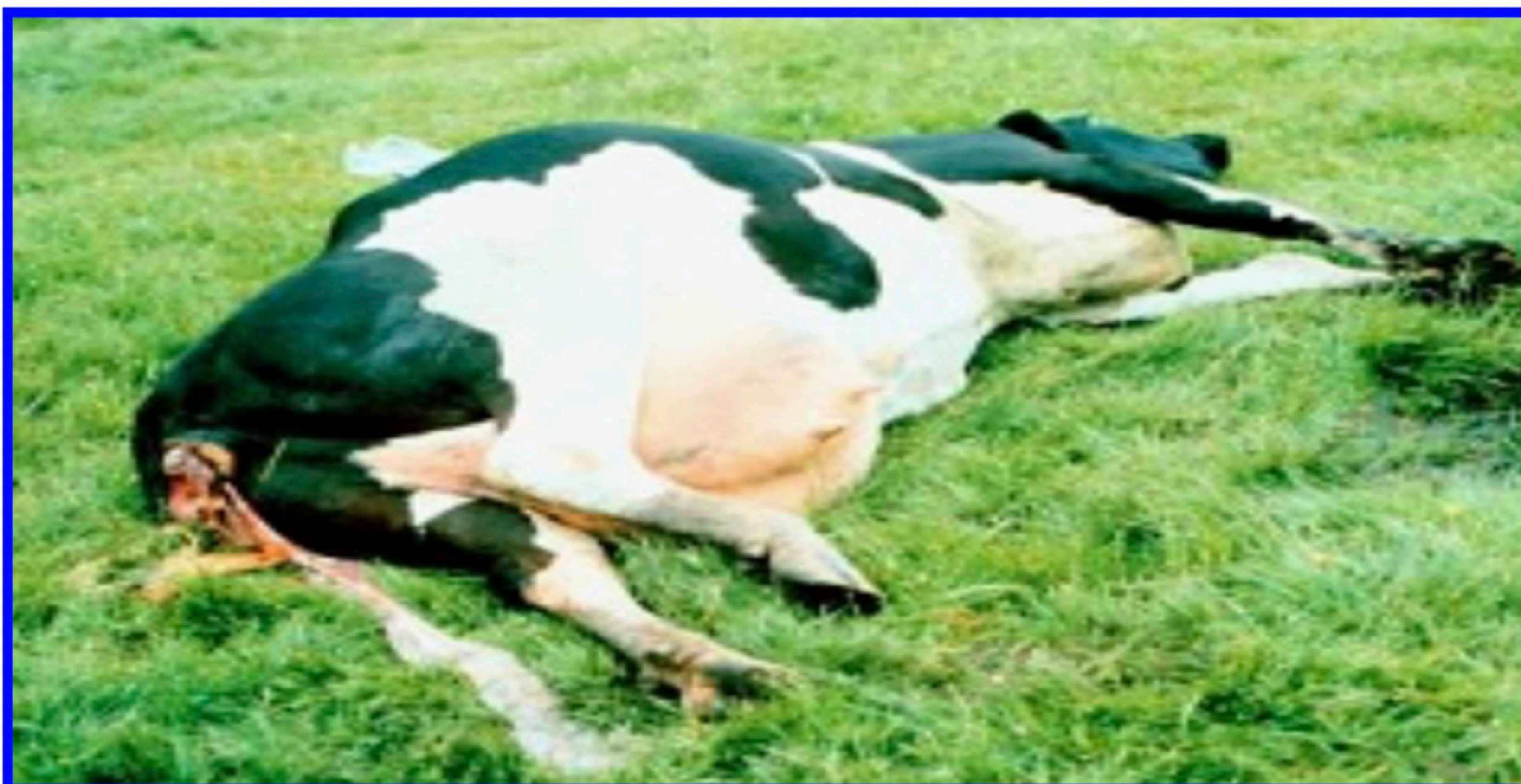
**Typical position of a milk fever cow.  
Note the 'S' neck and the rectum bulging with feces under her tail.**



# Clinical Signs

## ▶ Stage III – Lateral recumbency

- ▶ Unresponsive, unconscious stage, lying on side with legs stretched out, bloat develops, comatose
- ▶ Animals will die if untreated in this stage



# Treatment

## ▶ Stage I

### Oral or Intra Venous (IV) calcium salts

- ▶ Oral gels can absorb into the blood in ~15 min
- ▶ Oral treatment allows for higher Ca dosage
- ▶ May help prevent relapse

## ▶ Stage II & III

### Must treat with IV Calcium

- ▶ Administer slowly over period of 10 min
- ▶ May require subsequent treatments

Should respond with in 30 minutes of treatment and be standing



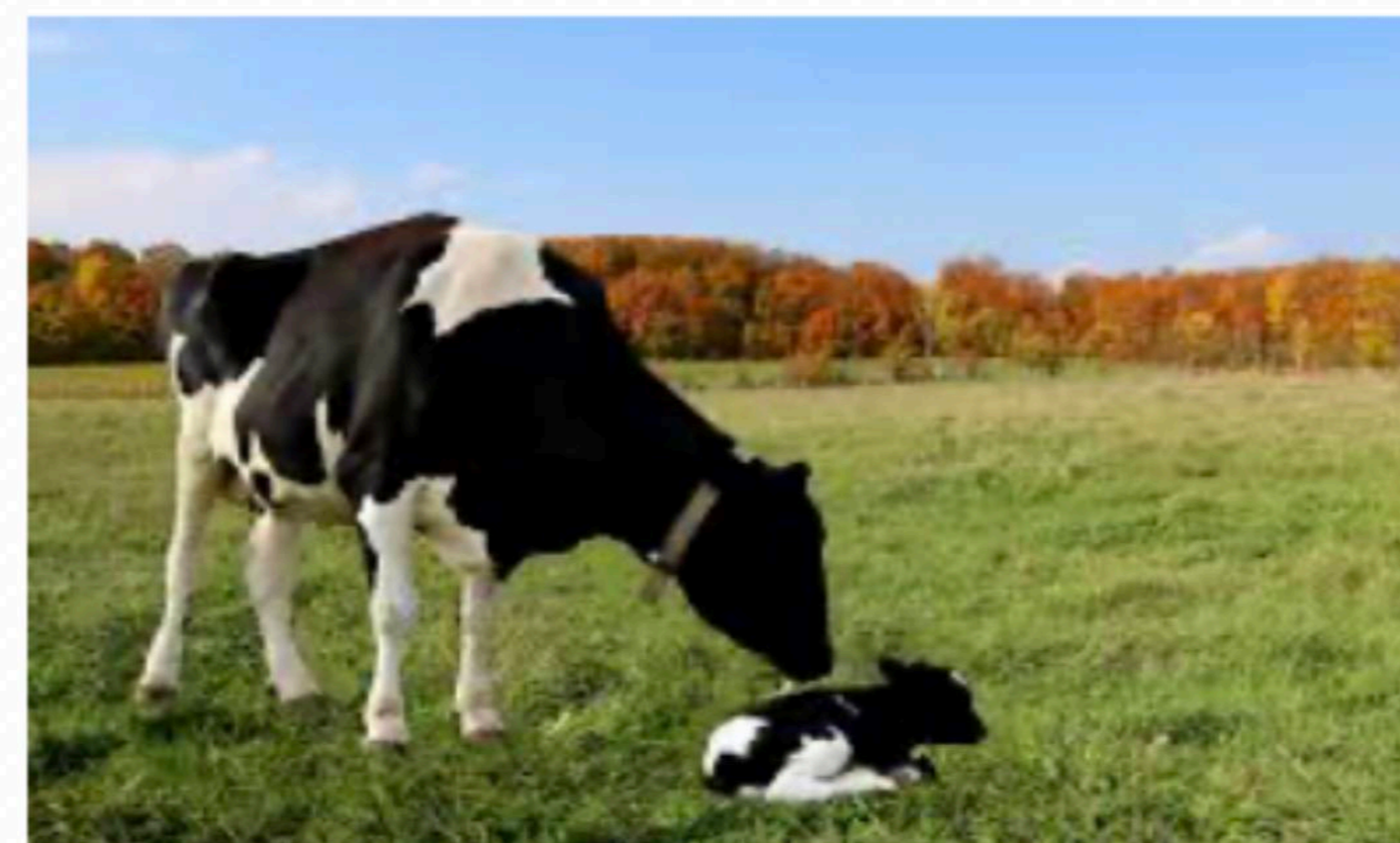
# Prevention and Control

- ▶ Good nutritional management practices in the pre and post parturient period
- ▶ Maintenance of Ca : P ratio
- ▶ Oral Calcium drenching - 50-60% efficacy
- ▶ Acidification of the diet
  - DCAD balance  $(Na+K)-(Cl+S)$
- ▶ Low Calcium ration during pregnancy (20g per day)
- ▶ Vitamin D and its analogue administration



## 2. Ketosis

- ▶ Most frequently happens in first 6-8 wks after calving; Very often affects first calf heifers or older cows
- ▶ 40 % herd affecting this disease 50 % cow under sub clinical to 20 % clinical
- ▶ Decreased blood glucose level to 25 mg/dl from 50-60 mg/dl; 60-85 % available glucose utilized for milk production
- ▶ Increase in free fatty acid (FFA) and triglycerides in plasma
- ▶ Decreased liver glycogen and increased liver lipid content (30 % Vs 7 % normal value)
- ▶ Deficiency of ACTH and cortisone causes ketosis



# Acetonemia / Ketosis

## ▶ Cause

- ▶ Occurs when intake doesn't meet requirements of the animal
- ▶ Excessive amounts of ketone bodies (acetone, aceto acetate and B-hydroxy butyrate (BHBA) found in urine, blood and milk
- ▶ Butyrate to BHBA in rumen epithelium
- ▶ Blood ketone: 10 mg to 50 mg/dl and low blood sugar (25 mg/100ml)
- ▶ BHBA: Aceto acetate ratio      Normal : 1:10.5 ; Ketosis: 1:3.6 to 1:4.3
  
- ▶ Animal mobilizes its own fat reserves
- ▶ Mobilized fat transported to liver and oxidized to Acetyl CoA
- ▶ Acetyl CoA oxidized to Aceto acetyl CoA via TCA cycle. It depends on adequate supply of oxalo acetate from the precursor propionate.
- ▶ Deficient of oxalo acetate limits Acetyl CoA oxidation and converted to Aceto acetate and BHBA
- ▶ Deficiency of ACTH and oxaloacetate
- ▶ Shortage of glucose precursors propionate AA and lactate

Can use a Keto Stick to test urine for ketone bodies