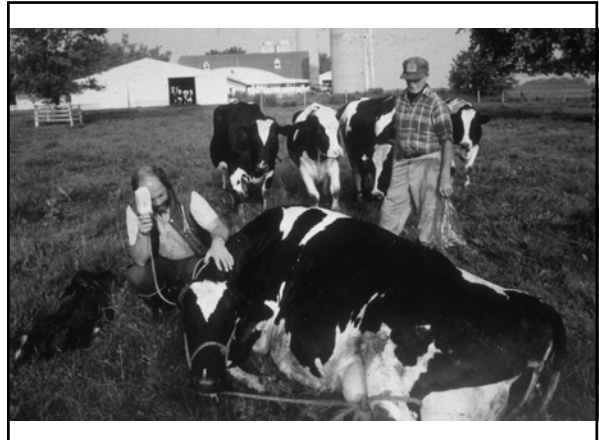


# METABOLIC DISEASES OF DAIRY CATTLE

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## MILK FEVER

Also known as: Hypocalcemia, Parturient Paresis

1. One of the most common disorders of dairy cattle.
2. Occurs at or near the time of calving.
3. Characterized by an inability to rise.
4. Caused by an imbalance of calcium.

## MILK FEVER

- I. Age of Cow
  - A. Incidence increases with age
    1. Almost never in first calf heifers, rare in 2<sup>nd</sup> calvers
    2. Rates of 20% reported for cows in 6<sup>th</sup> or greater lactation

## MILK FEVER

- II. Breed of Cow
  - A. Jersey's are particularly susceptible
- III. Seasonal Occurrence
  - A. Some evidence that incidence increases at the end of the grazing season
    1. Limited nutrition – Mg???

## MILK FEVER

Clinical signs: 3 stages

Stage 1: loss of appetite, lethargy

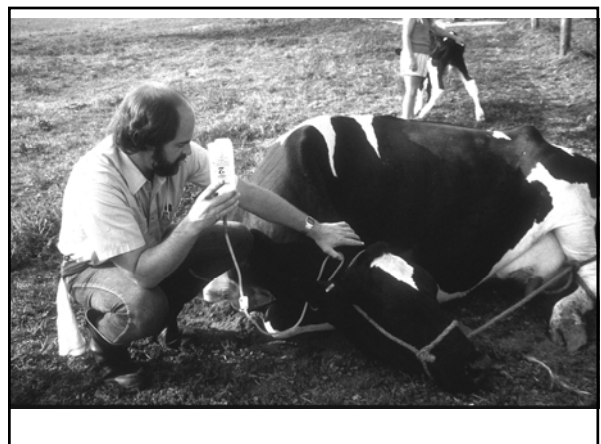
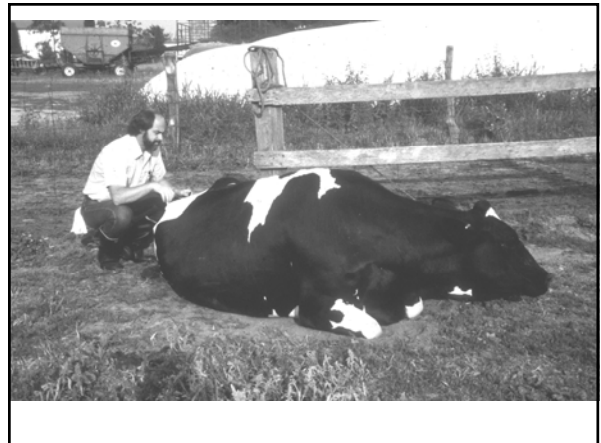
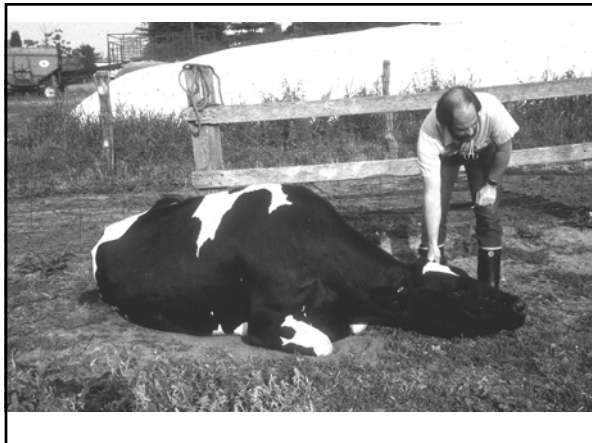
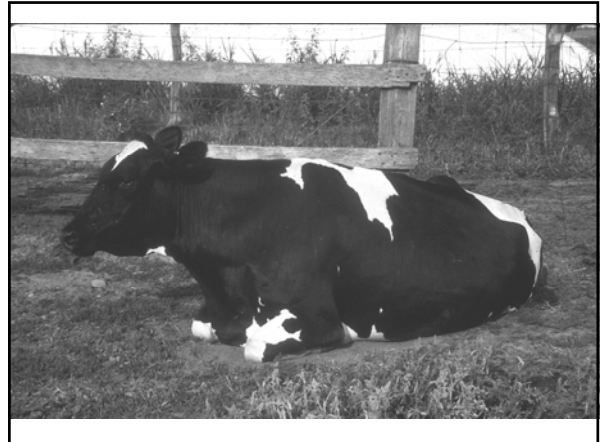
Stage 2: muscle tremors, teeth grinding, incoordination, occasionally excitable

Stage 3: cow is down and unable to rise, progresses to lie on side, coma & death

## MILK FEVER

### ■ Clinical Signs

- Body temperature – below normal: 100-101°F
- Curvature of the neck – often described as an “S” curve of the neck when viewed from rear
- Cold extremities
- In-coordination, wobbly and weak
- Occasionally, hyperexcitability

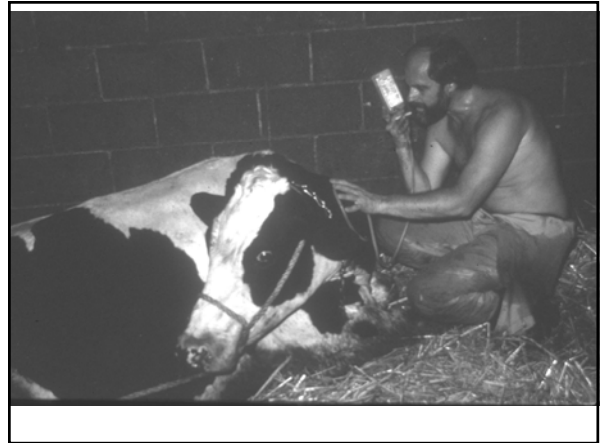




### **Milk Fever: Complications**

- Rumen bloat
- Muscle damage or injury leading to downer cow syndrome
- Prolapse of the uterus





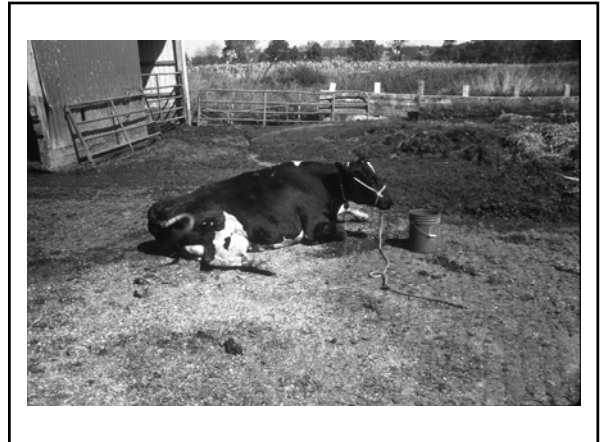
**HYPOCALCEMIA**

Clinical Manifestation:

- Milk Fever

Subclinical Manifestation:

- Retained Placenta
- Metritis
- Displaced Abomasum
- Ketosis

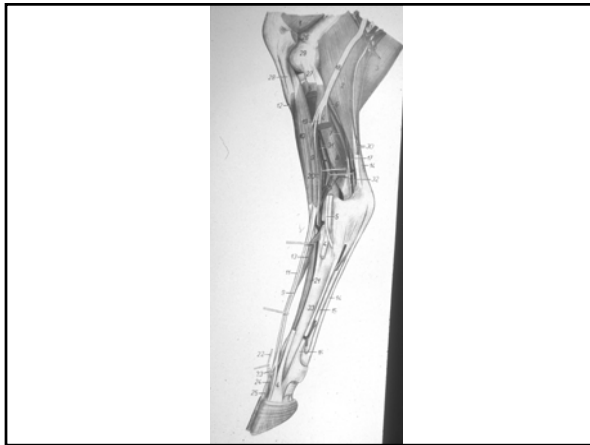
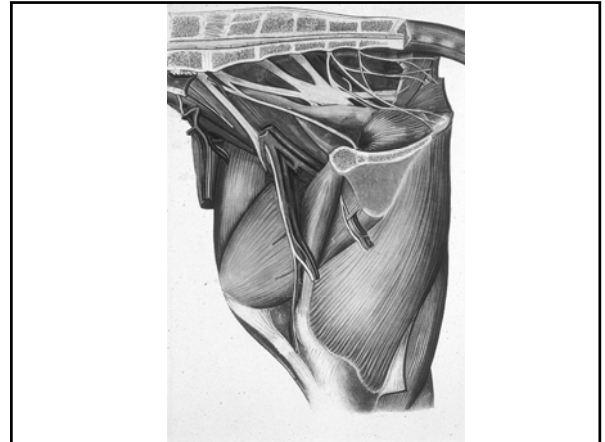


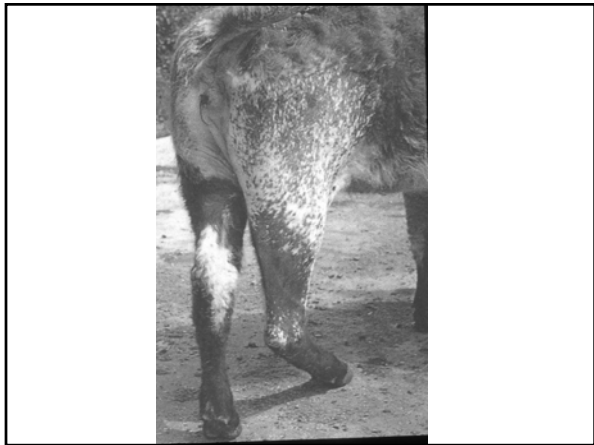
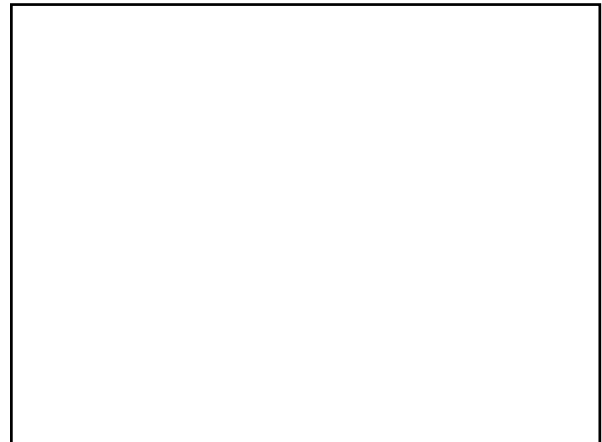
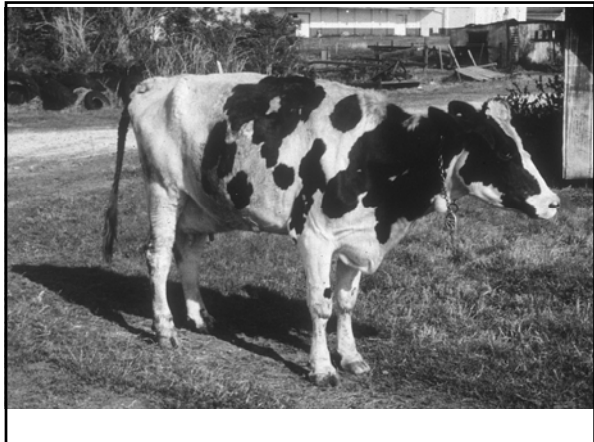
## DOWNER COW SYNDROME

Defined as.....any cow down for more than 24 hours

A. cows down for long periods develop severe muscle damage

1. Mortality at this stage – 60%





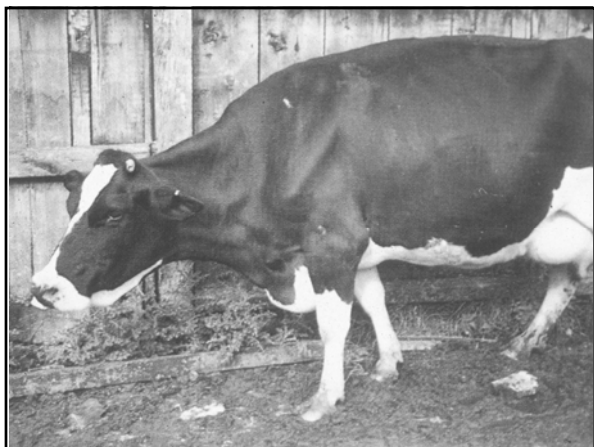
## HARDWARE DISEASE

...typically caused by the ingestion of metal objects which lodge in the reticulum, penetrate and cause a local peritonitis.

### Sequelae:

1. Traumatic pericarditis
2. Vagus indigestion

Treatment: Magnets, ???

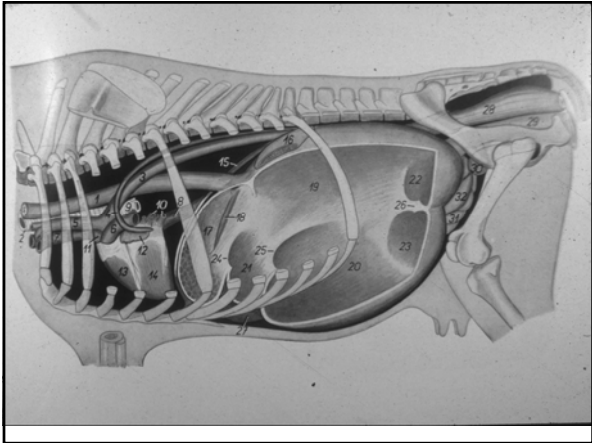




## BLOAT

Refers to the accumulation of gas in the rumen in one of two forms:

1. Free gas
2. Gas mixed with ingesta in the form of froth



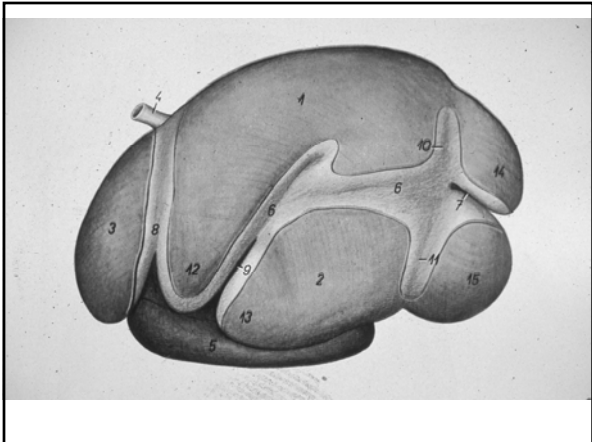
## BLOAT

Pasture bloat:

- A. Occurs when cattle feed on succulent legumes in pre-bloom stage.
  1. Frothing of rumen ingesta occurs as viscosity of rumen fluid increases

Secondary bloat:

- A. Choke or other obstructions of the esophagus
- B. Milk fever, other causes of rumen atony



## BLOAT

### ■ Treatment:

- Free Gas Bloat – pass a stomach tube
- Frothy Gas Bloat – pass a stomach tube, administer one of the following:
  - Polaxalene – Therabloat
  - Mineral oil – 1 gallon
  - Rumen trocar – only of value in conditions of free-gas bloat
  - Surgical removal of rumen contents
  - Creation of rumen fistula – usually for animals with chronic bloat problems

## RUMEN (LACTIC) ACIDOSIS

Feed changes cause the pattern of rumen fermentation to change from VFA to Lactic Acid (LA) production

- LA in rumen drops pH – dehydration
- LA kills off rumen microflora, damages rumen wall, and promotes absorption of bacteria
- increased release of histamine

## RUMEN (LACTIC) ACIDOSIS

### ■ Primary Cause:

- Ingestion of excessive quantities of highly fermentable carbohydrate feeds.
  - Acute Rumen Engorgment
  - Chronic lactic acidosis or better known as SubAcute Rumen Acidosis or SARA

## RUMEN (LACTIC) ACIDOSIS

### Common Sequelae:

Liver abscesses  
Ruminitis  
Bloat  
Laminitis

### Treatment:

Mild cases – Tincture of Time  
Rumen lavage  
Mineral Oil – 1 gallon

## SIMPLE INDIGESTION

.....Characterized by depressed appetite and reduced rumen/gastrointestinal tract motility.

- “Rumen Acidosis” – a common cause (difficult to distinguish between simple indigestion and rumen acidosis)
  - Overeating of concentrate feeds
  - Sudden changes in feeds or feeding patterns
- Other causes
  - Consumption of soured or moldy feeds

## SIMPLE INDIGESTION

### Clinical signs:

- Diminished appetite, reduced milk production
- Normal body temperature
- Rumen sounds greatly reduced

### Treatment:

- Treatment for rumen acidosis
- Mineral Oil – 1 gallon orally
- Rumen Transplants (trans-faunation of the rumen)
- Tincture of Time

## KETOSIS (ACETONEMIA)

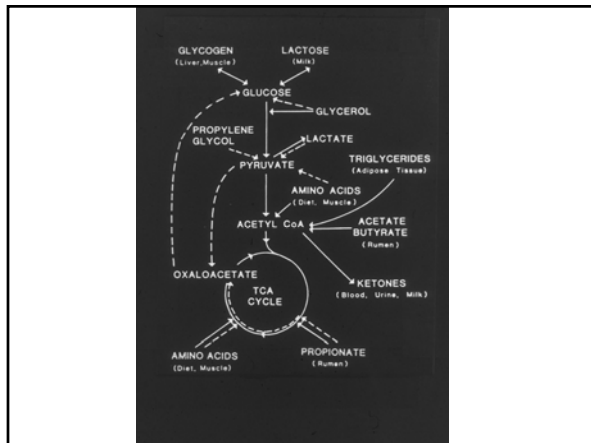
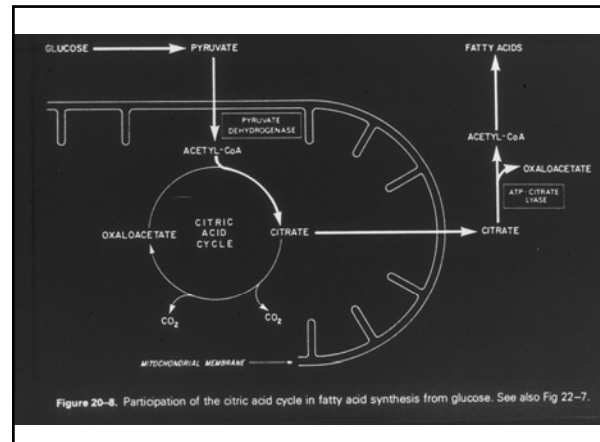
### Disease characterized by:

1. Reduced milk yield
2. Loss of body weight
3. Ketones in milk and urine
4. Nervous signs



## KETOSIS (ACETONEMIA)

- PRIMARY SPONTANEOUS KETOSIS
  - Negative energy balance conditions
  - Excessive feeding of silages with high levels of butyric acid
- SECONDARY KETOSIS
  - Ketosis resulting from other conditions which cause a reduction of appetite in early lactation – LDA, Hardware Disease, etc.



## KETOSIS (ACETONEMIA)

### Clinical signs:

1. Occurs within 3-6 weeks of calving
2. Rapid decline in milk production
3. Cows refuse to eat grain, but will eat hay
4. Cows lose body weight
5. Temperature is normal, acetone detectable on breath, urine and milk

## KETOSIS (ACETONEMIA)

### Treatment:

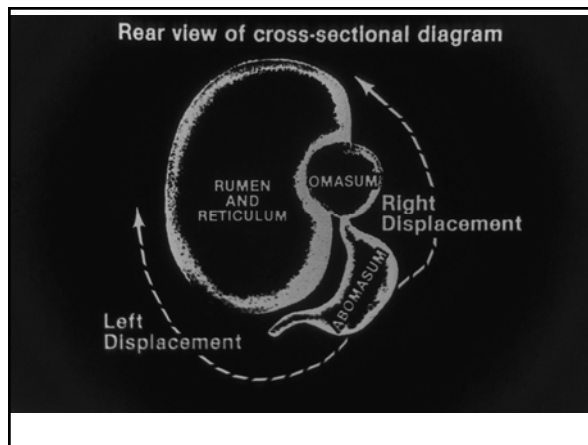
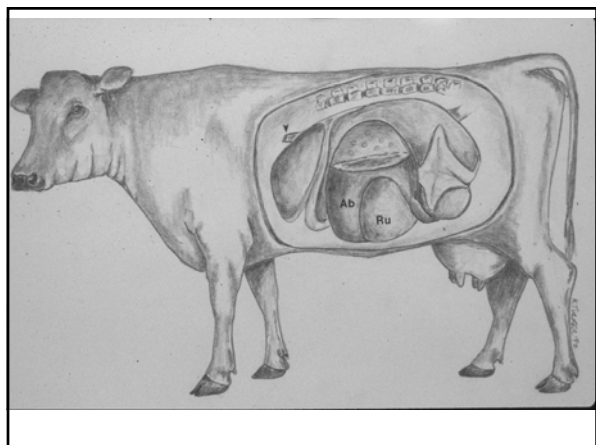
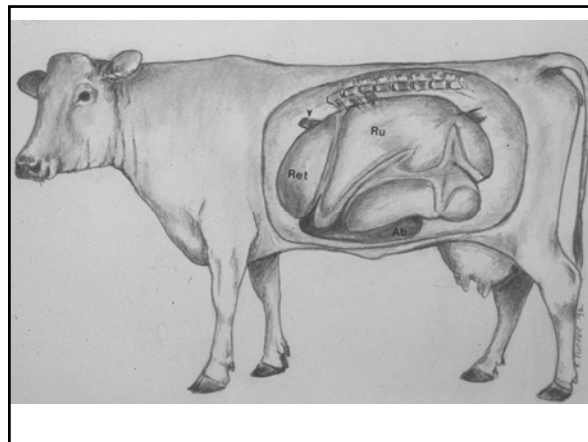
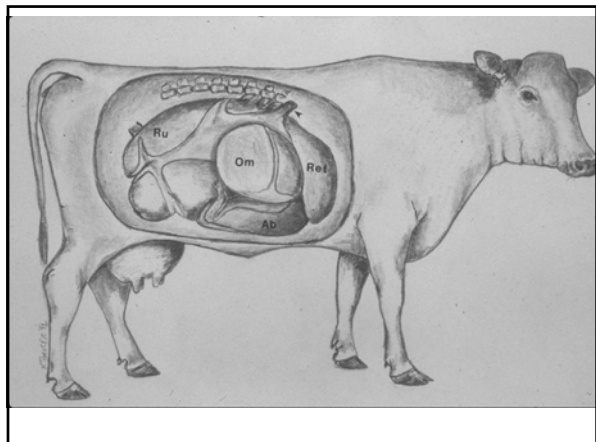
1. Intravenous glucose
2. Propylene glycol orally
3. Glucocorticoids - Dexamethazone

## DISPLACED ABOMASUM

### Left Displaced Abomasum:

- A. Results when the abomasum becomes displaced to left side of the cow between the rumen and body wall

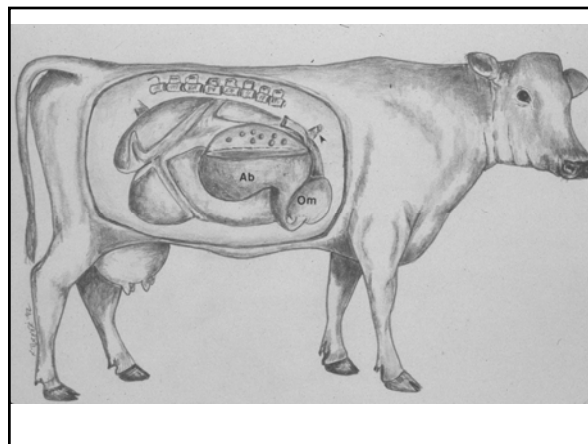
1. 80% occur within 1<sup>st</sup> month of lactation

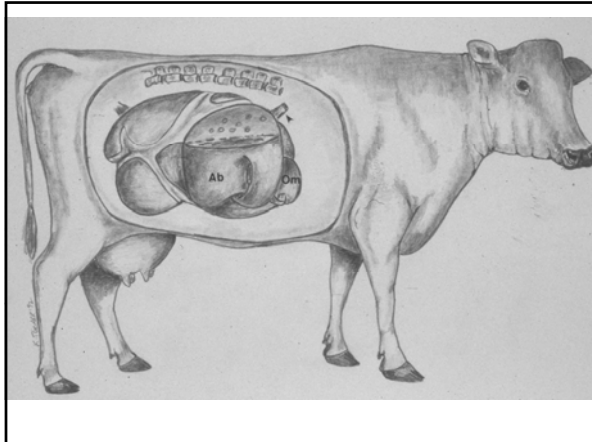


## DISPLACED ABOMASUM

### Clinical signs - LDA and RDA:

- Off feed, will eat hay but no grain
- Mild to moderate ketosis
- "Ping" and/or distension over the left paralumbar fossa (LDA)
- Ping and distension over the right paralumbar fossa (RDA)
  - Must be distinguished from a torsion of the abomasum

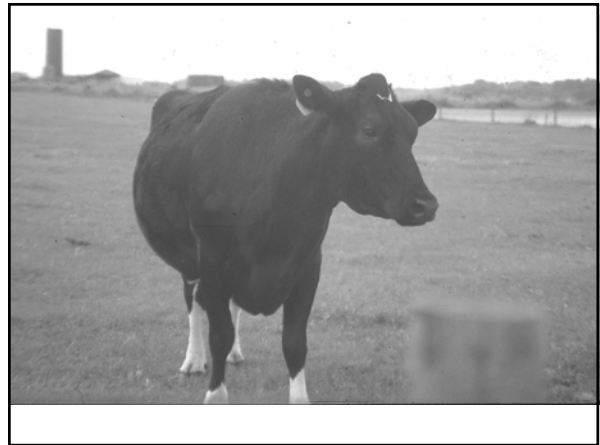
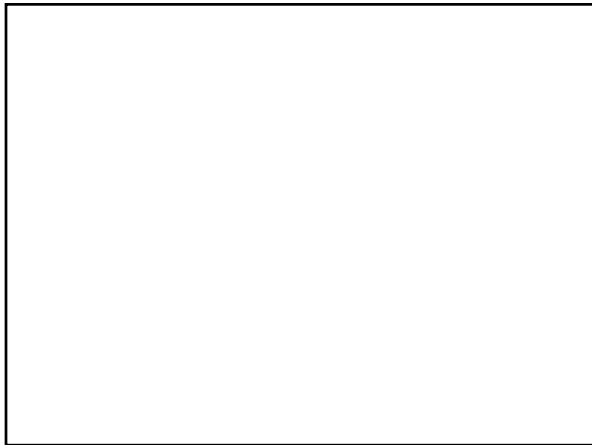




## DISPLACED ABOMASUM (ABOMASAL TORSION)

Clinical signs – RTA:

1. Varying degrees of abdominal pain
2. Cow will not eat or drink
3. Distension is noticeable on the right side of cows abdomen
4. RTA's can usually be palpated rectally
5. "Ping" on the right side



## FAT COW SYNDROME

...a clinical syndrome associated with a higher incidence of metabolic, infectious, and reproductive disorders – such as milk fever, ketosis, and retained placenta.

-caused by the accumulation of fat in the liver which limits critical liver function

## FAT COW SYNDROME

Mechanisms in fatty liver development:

1. Greater uptake of fatty acids mobilized from peripheral tissues.
2. Inadequate secretion of liver triglycerides.

## FAT COW SYNDROME

Predisposed by:

Feeding errors which encourage cows to become excessively over conditioned during late lactation or the dry period.

- morbidity as high as 50-90%
- death rate as high as 25%

## FAT COW SYNDROME

Clinical signs:

1. Fat cows in the dry herd.
2. Thin cows in the fresh cow herd.
3. Increased incidence of metabolic and infectious disease – LDA, Ketosis, etc.
4. Increase in the number of animals which respond poorly to treatment.

## FAT COW SYNDROME

Postmortem findings:

1. Large amounts of fat deposited around kidneys, heart, pelvis, and omentum.
2. Liver – pale and enlarged due to fat deposition

## FAT COW SYNDROME

Prevention:

1. Monitor body condition and feed accordingly
  - 3.0-3.5 during late lactation
  - 3.5-4.0 at dry off
  - 3.5-4.0 at calving
  - 2.5-3.0 at peak lactation
2. Provide high quality forage to fresh cows and bring onto concentrate feed gradually.
3. Supply adequate protein in ration – proper balance between degradable and undegradable



## MISCELLANEOUS ABNORMALITIES OF THE BOVINE MAMMARY GLAND

I. Blood in the milk:

A. Causes

1. Rupture of mammary blood vessels usually associated with trauma
2. Capillary bleeding associated with udder congestion at or near calving

## MISCELLANEOUS ABNORMALITIES OF THE BOVINE MAMMARY GLAND

### II. Udder edema:

#### A. Physiological congestion at calving

1. May interfere with milking and predispose to mastitis

## MISCELLANEOUS ABNORMALITIES OF THE BOVINE MAMMARY GLAND

### II. Udder edema:

#### B. Causes:

1. Restricted venous and lymphatic drainage associated with the increased intra-abdominal pressure of the fetus in the pelvic cavity.
2. Hypoproteinemia associated with colostrum formation?
3. Possibly heavy grain feeding

## MISCELLANEOUS ABNORMALITIES OF THE BOVINE MAMMARY GLAND

### II. Udder edema:

#### C. Treatment of severe cases:

- 1) Frequent milking
  - a) Before and after parturition
- 2) Diuretics and corticosteroids
  - a) Naquasone, Lasix

## MILK FEVER PREVENTION

### Traditional Approach:

“Restrict calcium intake of dry cows”

## DRY COW DCAD DIET FORMULATION

↑ calcium to 150 – 180 grams/cow/day

- Supplement  $\text{CaSO}_4$  or  $\text{CaCl}_2$

## KETOSIS (ACETONEMIA)

### Niacin Supplementation:

- A. results vary from improvement in milk yield to no response
1. West German study – 17.4% increase in yield
  2. Kansas study – 9.9% increase in milk yield
  3. Illinois study – no response

## KETOSIS (ACETONEMIA)

### Proposed mechanism for Niacin supplementation:

- A. Niacin favors or enhances lipogenesis thus slowing lipolysis
  - 1. This reduces FFA mobilization from extrahepatic tissues therefore reducing the rate of ketone formation in the liver.

## KETOSIS (ACETONEMIA)

### Suggested supplementation rates:

6 – 12 grams Niacin/day starting 2 weeks prepartum through 10 weeks postpartum