Unit : Fluid therapy in cattle
Lesson : 3

# Acid– base imbalances and rehydration management

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# Thumb rule

- Maintenance requirement = 50 ml/kg/day

- Fluid requirement in Litres = surface area x 2L/sq.m

# Calculating fluid requirement

- Please calculate the fluid requirement for a

  **450 kg** body weight cow

  = ?

- Fluid requirement in Litres

  = surface area x 2L/sq.m

| Kg | SA (sq.m) | Total fluid requirements |
|---|---|---|
| 1 | 0.10 | 0.20 |
| 5 | 0.29 | 0.58 |
| 10 | 0.46 | 0.91 |
| 20 | 0.72 | 1.44 |
| 50 | 1.32 | 2.64 |
| 100 | 2.10 | 4.20 |
| 250 | 3.83 | 7.65 |
| 450 | 5.64 | 11.28 |
| 500 | 6.04 | 12.10 |
| 800 | 8.24 | 16.50 |
| 1000 | 9.55 | 10.10 |

# Calculating fluid requirement

- Fluid requirements based on SA
  = 5.64 x 2 L/kg
  = 5.64 x 2
  = 11.28 L

- Based on body weight
  = body weight x 50ml /kg body weight
  = 450 x 50
  = 22.5 L

# Calculating fluid requirement

- While there is a 100 fold increase in body weight from 10 kg to 1000kg, there is only a 20 fold increase in surface area.

- This shows that the relationship between bodyweight and maintenance fluid requirement is NON LINEAR

# ACID– Base Imbalances

- D- lactic acidosis, urinary tract diseases, SI strnagulation/ obstruction, choke
  : met. Acidosis+ low HCO3, severe dehydration

- Rx : NaHCO3 initially followed by electrolytes.

# ACID– Base Imbalances

- Neonatal calf diarrhoea : met. Acidosis+ low $HCO_3$, severe dehydration, loss of Na, hyperkalemia

- Rx : mixture of isotonic saline+ isotonic $HCO_3$ + 5% dex. (10 g glucose/L of solution)

# Isotonic sodium bicarbonate

- 15 ½ ampoules
- 155 ml in 845 ml of water
- Will be isotonic

# Base deficit

## Diarrhoea Calf

- < 1 week: 10- 15 mEq/l
- > 1 week 15- 20 mEq/l

# ACID– Base Imbalances

- RDA, impaction, torsion, vagus indigestion
  Caecal displacement/ torsion
  : met. Alkalosis, hypochloremia, severe dehydration

- Rx : balanced electrolytes or high K/ Cl acidifying solution

# ACID– Base Imbalances

- Intestinal obstruction : met. Alkalosis, hypochloremia, Hypokalemia
- Rx : balanced electrolytes or high K/ Cl acidifying solution

# ACID– Base Imbalances

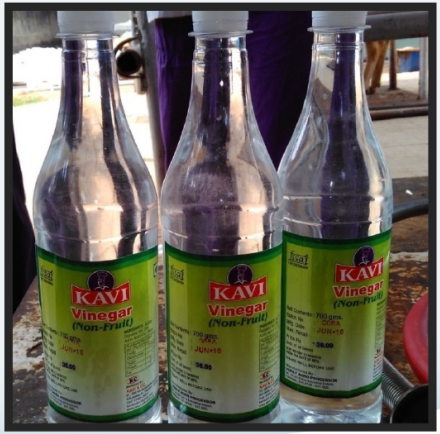
- Acute diffuse peritonitis : dehydration, slight met. alkalosis
- Rx : balanced electrolytes in large quantities

# ACID– Base Imbalances

- Per acute mastitis : Severe dehydration, Mild electrolyte defects,hypo cal. Acidosis if diarrhoea.
- Rx : Balanced electrolytes in large quantities

# Ruminal Alkalosis / Putrefaction Treatment

- Oral acetic acid 2.5 % 1- 2 liters orally 2-3 days



# Ruminal Alkalosis / Putrefaction Treatment

- Oral acetic acid 2.5 % 1- 2 liters orally 2-3 days
- NaCl/ DNS IV
- Putrefaction, oral antibiotics, tetracycline @ 20 mg/ kg for 2-3 days followed by rumen liquor
- Rumenotomy in severe cases

# Hypertonic Saline Solution

- **Indications** : Haemorrhagic/ septic / endotoxic
  @ 3-5 ml/kg intravenous

- **Solution** : 3- 7.5% NaCl

# Ketosis

- D20%
- Isoflupredone

# Hypokalemia

- Supplement potassium
- SLOW iv
- AVAILBILITY : 10 ml ampoules

- Can also be after treatment of rumen lactacidosis

# Potassium

- 1.15 % KCl = 3.2 ml/kg /hr
- = 0.5 mEq/kg/hr

| Serum conc | mEq/500ml | ml/kg/hr |
|---|---|---|
| <2 | 40 | 6 |
| 2.1- 2.5 | 30 | 8 |
| 2.6- 3.0 | 20 | 12 |
| 3.1- 3.5 | 14 | 18 |
| 3.6- 5.0 | 10 | 25 |

# Rapid infusion of dextrose

- Phosphorus

Gruenberg et al., 2006
J. Vet. Intern Med

# Thank you