

Fluids

more...



concentrated ions

- potassium chloride
- bicarbonate
- calcium (boro) gluconate
- magnesium hypophosphite
- magnesium sulphate



potassium

- **hypokalaemia**

- give KCl
- **dilute before use**
- label bag

- **hyperkalaemia**

- correct acidosis
- soluble insulin in 5% dextrose
- (calcium borogluconate)





potassium

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acidosis

- sodium bicarbonate solution
- incompatible with Hartmann's
- avoid (relative) overdose



bicarb

- estimate / measure base excess
- estimate blood volume
- calculate BE in blood
- give this much bicarb
- reassess



What would you do?

- 500kg TB with colic
- severely depressed and shocked



haematology

- PCV 65%
- arterial BE -10mM



treatment

- fluids then
- surgery



fluids

- Hartmann's / saline
- colloid
- bicarbonate



bicarb dose

- 500kg horse, BE -10mM
- blood volume 50L
- therefore needs $50 \times 10 = 500\text{mmol}$ to correct **blood BE**
- = 500mL 8.4% NaHCO_3^-
- = 833mL 5%



parenteral nutrition

- lipid emulsions
- amino acid solutions
- propylene glycol
- propionate
- glycerol



parenteral nutrition

- lipid emulsions
- aminoacid solutions
- not glucose



problems

- central catheterisation
- phlebitis
- sterility
- cost
- avoid



ruminants

- metabolic disturbances common
- prevention is better than cure!



ketosis

- **glucose precursors**
 - propylene glycol
 - propionate
 - glycerol
- **glucocorticoids**



hypocalcaemia

- milk fever
- eclampsia
- oxalate poisoning



milk fever

- **calcium salts**
 - 1mg calcium =
 - 11.2mg calcium gluconate =
 - 13.2mg calcium borogluconate
- **compound Ca / Mg / P salts**
- **vitamin D**



calcium

- slow iv
- care with sc injections
 - vasoconstriction
 - very slow absorption
 - danger of ischaemic necrosis
 - **NEVER** in dogs & cats



hypomagnesaemia

- prevent with Mg po
 - ruminal bolus
 - calcined magnesite on pasture
 - etc etc
- compound Ca/Mg/P iv
- magnesium sulphate sc not iv



trace elements

- only a trace needed
- beware toxicity, esp Se



oral fluids



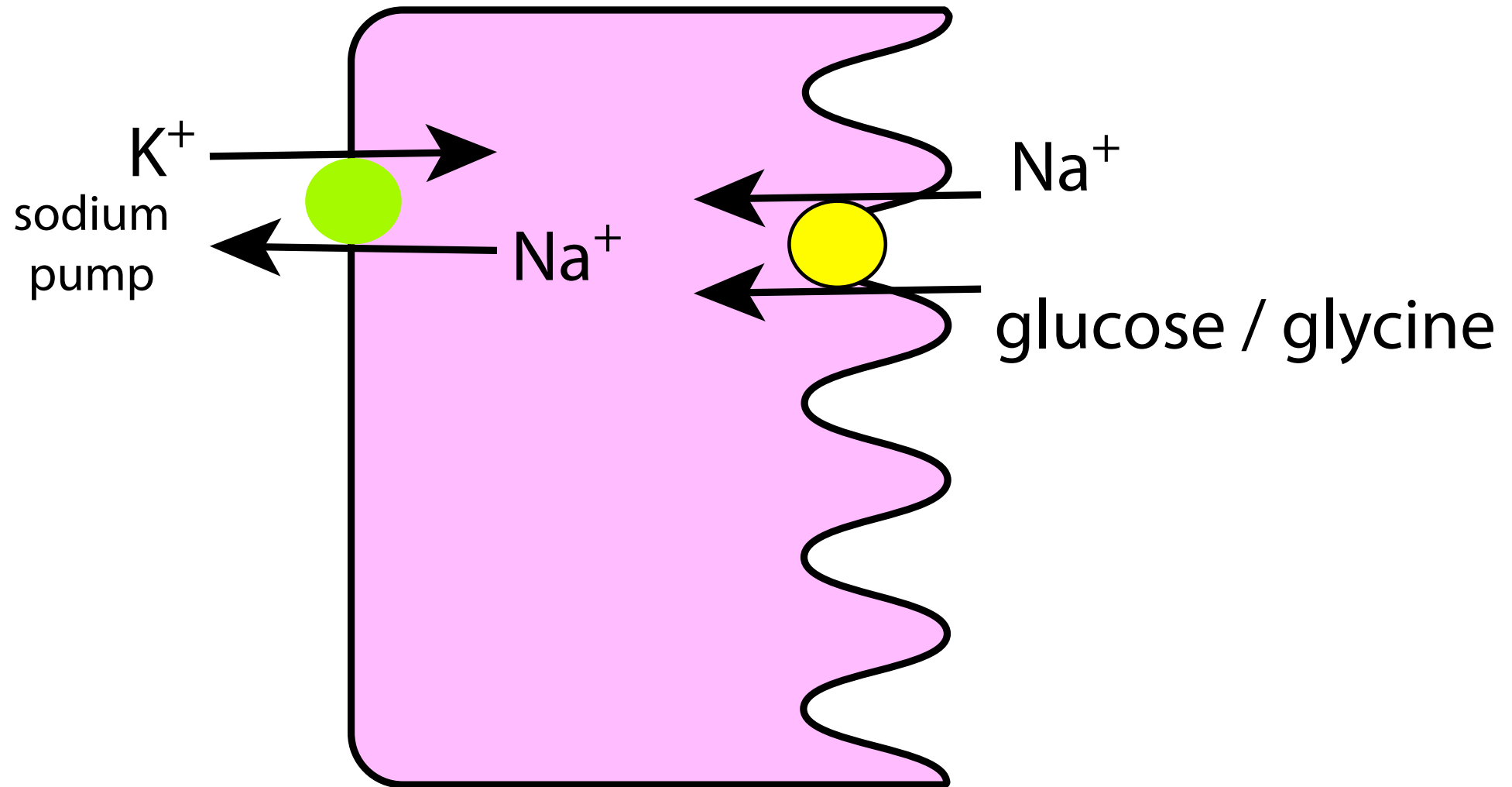
oral fluids

- Na^+ , K^+ , Cl^-
- glucose or glycine
- bicarbonate precursors
- (starch)
- tap water



ECF

gut



bicarb precursors

- propionate - 1 HCO_3^-
- citrate - 3 HCO_3^-
- acetate - 1 HCO_3^-



starches

- metabolised to glucose



water

- need not be sterile
- solution must be slightly hypotonic



indications

- diarrhoea
 - especially neonatal animals
- water deprivation



contra-indications

- vomiting
- gut obstruction
- severe electrolyte imbalances
- shock



administration

- allow to drink
- drench with bottle
- stomach tube
- pharyngostomy tube



dose

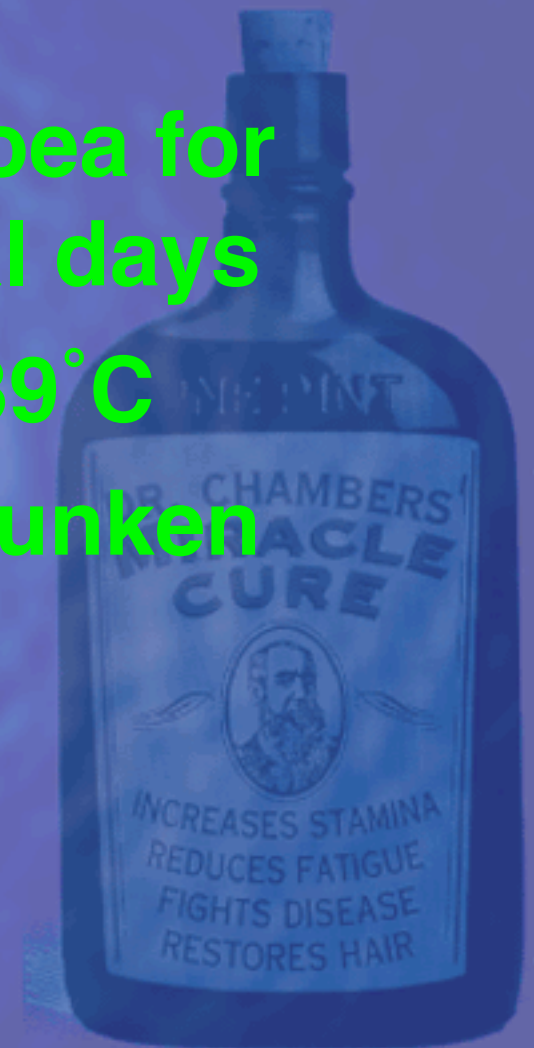
- ad libitum
- little and often



weaner piglet



- diarrhoea for several days
- temp 39°C
- eyes sunken



problems

- water loss
- ion loss



treatment

- oral fluids
- not antibiotics



What would you do?

- 5 week old Rottweiler pup
- severe vomiting & diarrhoea for 3 days
- temperature 37° C
- panting
- anuria
- anorexia



problems

- parvovirus infection
- gut mucosal damage
- water loss
- ion loss



treatment

- Hartmann's iv
- colloids?
- antibiotics?
- antiemetics?
- nutrition?
- infection control!!!



fluids

- use oral fluids rather than iv where possible
- avoid parenteral nutrition - use pharyngostomy tube
- prevent metabolic disease in ruminants rather than wait and try to cure it

