

# 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%  $\text{NaHCO}_3^-$
- = 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



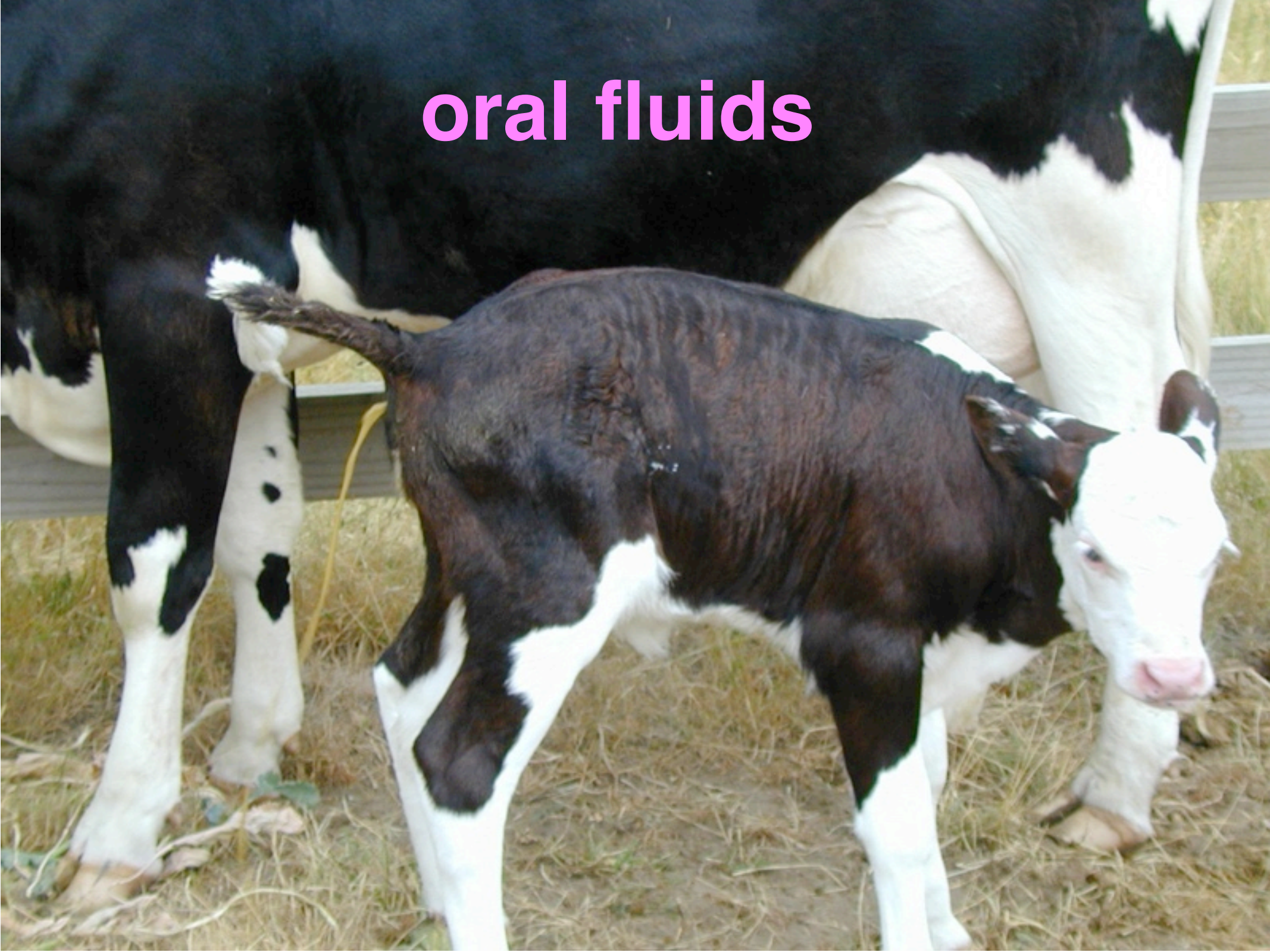
# trace elements

- only a trace needed
- beware toxicity, esp Se





**oral fluids**





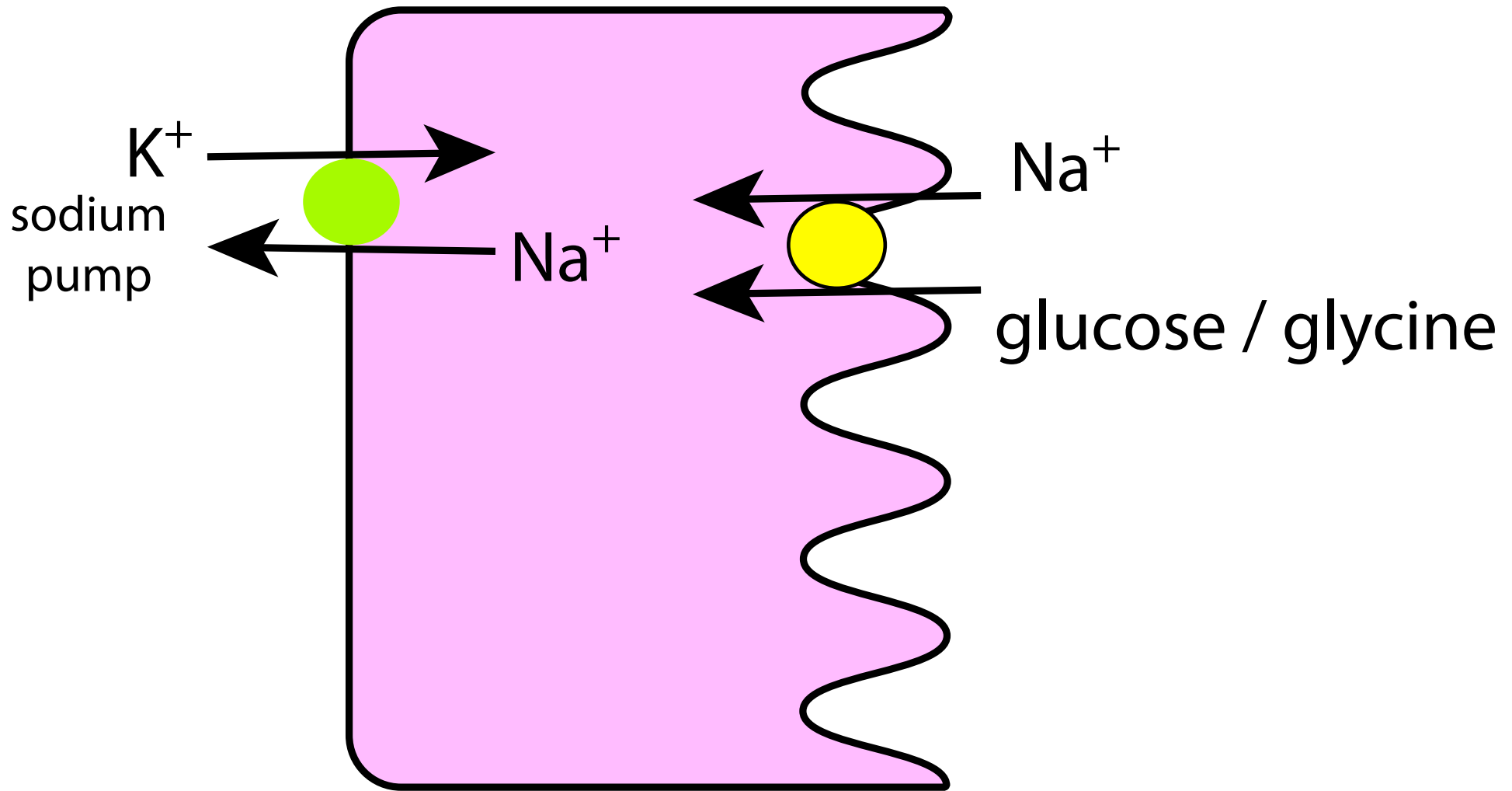
# oral fluids

- $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Cl}^-$
- glucose or glycine
- bicarbonate precursors
- (starch)
- tap water



**ECF**

**gut**



# bicarb precursors

- propionate - 1  $\text{HCO}_3^-$
- citrate - 3  $\text{HCO}_3^-$
- acetate - 1  $\text{HCO}_3^-$





# 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

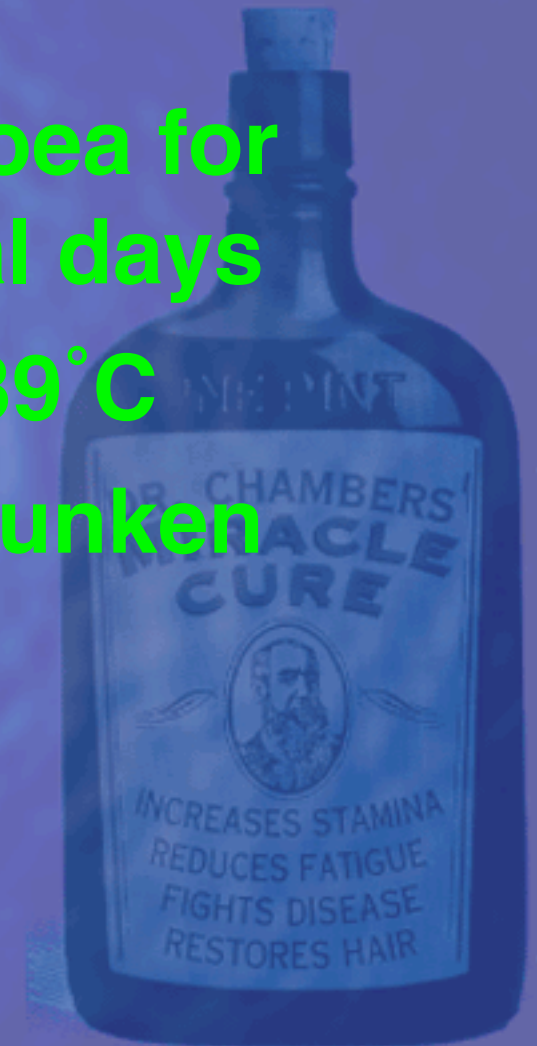




# weaner piglet



- 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

