LACHLAN
LIVESTOCK HEALTH AND PEST AUTHORITY
LHPA
Safeguarding Agriculture in NSW

Water Quality – how it can effect livestock health

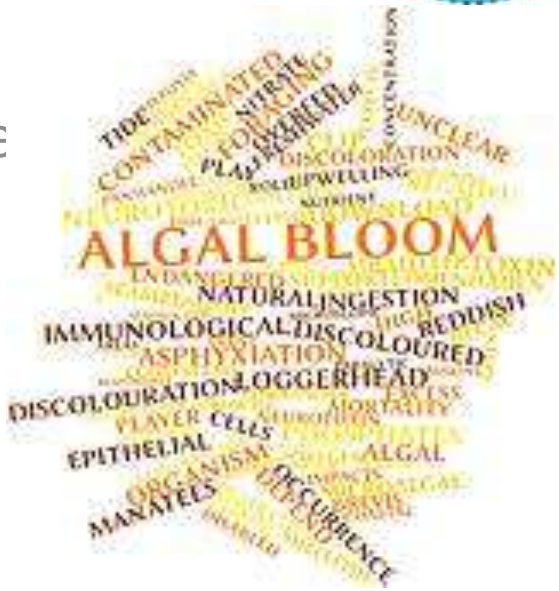
Healthy Farm Dams Workshop

Saturday Mar 16th 2013

Frogmore Community Hall

What could be in your water?

- E coli, Salmonella, Campylobacter jejuni (all zoonotic), Botulinum toxin, Johnes bacteria, Tuberculosis bacteria, Leptospirosis
- Heavy metals – lead, arsenic, mercury,
- Nitrates – nitrites
- Blue Green Algae
- Water quality – pH, salinity, chloride



How do they get in there?

- Build up of faeces
- Run off of fertilisers, chemicals into the dam
- Washing of leaf litter, plant material especially after rains
- Carcasses left in dams (birds, animals etc)
- Seepage from ground water

- **All above = nutrients (feaces, fertiliser, carcasses, plant material) = bacteria or algae growth**
- **Seepage / chemicals = risk of toxicity**

The Ideal Water

- **pH 6.5 - 8.5** … ⇩ (<5.5) = ⇩ feed intake;
  - ⇧ (>9) = diarrhea, digestive upset = ⇩ intake and FCE
- **Salinity** … sum of all mineral salts (eg. Na, Ca, Mg, Cl, SO4, CO4)
  - Effects depend on type of stock, feed water / mineral content, temperature, which minerals in the water
  - **Beef Cattle**: 6300-7800 uS/cm – initial reluctance to drink +/- diarrhea but will adapt.
    - 7800-15600 uS/cm – loss of production expected. Could handle for short periods
  - **Sheep**: 7800-15600 uS/cm - initial reluctance to drink +/- diarrhea but will adapt.
    - 15600-20300 uS/cm - loss of production expected. Could handle for short periods**

The Ideal con'd

- **Chloride** – an excess of Cl = salt toxicity
- Salt toxicity = ⇩ rumen function ⇨ dehydration ⇨ kidney failure ⇨ nervous system problems ⇨ death

  - **Beef Cattle**: max 4000 mg/L
  - **Ewes and lambs**: max 2400 mg/L
  - **Adult dry sheep**: max 2400 mg/L

How much water do stock need?

- **Volume** – need to have enough to suit their needs!

Stock type	Consumption (per had per day in Litres)
Weaners – average all feeds	2-4 L / hd / day
Adult dry sheep – grasslands	2-6 L /hd/day
Ewes with lambs – dry feed	4-10 L/hd/day
Cows with calves – dry feed	40-100 L/Hd/day
Young weaners	25-50 L/hd/day
Dry cattle (400kg)	35-80 L/hd/day

Calculating water in dams etc

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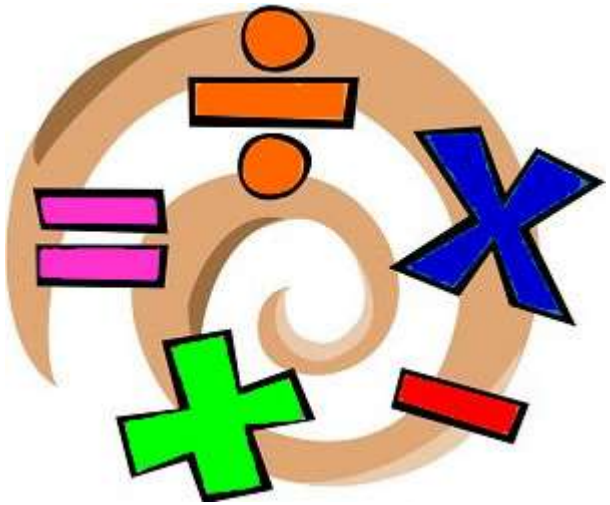
  - 0.4 x Length x width x depth = '*X* ' megalitres water

    1000 (1 megalitre = 1 million litres)
- Allow for - silt in bottom
  - 25% evaporation over summer
  - further 10% spoilage
- Calculating the volume of water in your dam:
  - 20 metres x 40 metres x 10 metres deep
  - 0.4 x (20 x 40x10) / 1000 = 3.2 megalitres water
  - Cleaned out last year so no silt at this stage
  - 25% evaporation = 0.8 megalitres lost over summer
  - 3.2 – 0.8 = 2.4ML to work with
- Eg. 100 head cattle – need 100 L / day … water will last 2.4ML / [(100head x 100L/d)/1,000,000] = 240 days without considering any spoilage!
- Eg. 500 sheep – need 10 L / day … water will last 2.4ML / [(500 head x 10L/d)/1,000,000] = 480 days – again without considering spoilage!



Ways to treat “dirty dams”

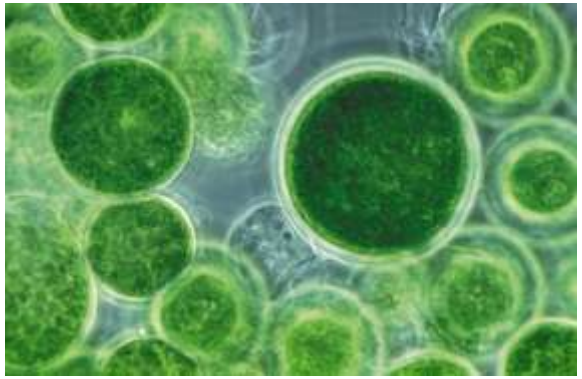
- Monitor (shallow, open sun position dams in particular as they are more prone to concentrate toxins and have algal blooms)
- Remove as much debris as possible (esp applies when storm rains are to blame)…
- Alum and gypsum @ 50kg each / 1000 cubic metres (eg. per 1 ML) of dam water can be used to settle out nutrients in water
- Remove carcasses … esp. birds if you notice them – they are the source of botulism usually when water is involved. Other carcasses can lead to the other nasties (E coli, Salmonella, etc)

Blue Green Algae

- temperatures + water levels = potential for bloom
- “suspension of green paint” with an earthy smell

Treatment options for BG Algae

- There is no treatment for the animals if they drink toxic water
- Remove stock from contaminated source
- Chemical water treatments do cause the algae to die … so potential for more toxicity before gets better!!
  - Copper Sulfate (registered as Coptrol)
  - Simazine (permit approval to treat dams)
  - Keep stock off dams for at least 10 days (preferably 2-3 weeks)



Thank you!

- Handouts –
  - Water requirements for sheep and cattle
  - Keep an eye on your farm dams (Blue green algae info)

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