



Groundwater Quality For Cattle

All groundwater contains various kinds of dissolved salts (minerals). If present in excessive concentrations some of these can limit the uses of the water. When a bore is drilled, a water analysis should be carried out to determine if any of the salts exceed guideline values. This sheet provides some information to help interpret the water analysis.

Source of Dissolved Salts

The salts originate from minute quantities dissolved in rain water and from the chemical breakdown of rocks. Nitrate is also produced in the soil by natural biological activity. Over long periods of time evaporation concentrates them to varying degrees.

Guideline Values

The maximum recommended values listed below are guidelines rather than strict limits as there are often many factors governing how a particular salt affects cattle. For example, factors such as the age and health of the cattle, the time of year, the distance they walk each day and whether or not they have access to other water sources. The guidelines given below are conservatively chosen in order to cover most situations.

Total Dissolved Solids (TDS) 10,000 mg/L

TDS is the sum of all the salts present and it provides a convenient guide to water suitability. There may also be a need to assess concentrations of specific salts causing purgative or toxic effects, especially if the TDS is greater than 2500 mg/L.

If TDS is in the range of 4000-5000 mg/L stock may have an initial reluctance to drink or there may be some scouring, but they should adapt without loss of production.

From 5000-10,000 mg/L, loss of production and a decline in animal condition and health would be expected. Stock may tolerate these levels for short periods if introduced gradually.



Photo 1 - It is important to understand surface water and groundwater quality to maintain stock health.

Calcium 1000 mg/L

Levels above 1000 mg/L may cause phosphorus deficiency by interfering with phosphorus absorption in the gastrointestinal tract.

Magnesium

In high doses, magnesium can cause scouring and diarrhoea in cattle. Levels up to 2000 mg/L have been observed to have no adverse effects. There is insufficient information available at present to set a guideline value.

Sulfate 2000 mg/L

No adverse effects should be expected below 1000 mg/L. From 1000-2000 mg/L sulfate can cause diarrhoea, particularly in young cattle. Concentration above 2000 mg/l can cause chronic or acute health problems.

Nitrate 400 mg/L

Excess nitrate can cause toxic symptoms and even death by reducing the oxygen carrying capacity of the blood. Stock may tolerate higher nitrate concentrations in drinking water provided nitrate concentrations in feed are not high. Levels above 1500 mg/L are likely to be toxic and should be avoided.

Fluoride 2.0 mg/L

Excess fluoride can cause tooth damage to growing animals and brittle bones and lesions in older animals. If livestock feeds or salt licks contain fluoride, the drinking water limit should be reduced to 1.0 mg/L.

pH 6.0 - 9.0

pH is a measure of the acidity or alkalinity. Values less than 6.5 indicate acidic water and can result in corrosion of pipes and fittings. When pH is more than 7.5 the water is alkaline and crustation of pipes with calcium carbonate can occur. Water that is too acidic or alkaline can cause digestive problems in cattle, and can in turn reduce water consumption, depress appetite and hence limit production.

The composition of mineral supplements to stock feed must be considered when stock waters are near to the guideline limits, especially for fluoride and sulfate. Further information is available from the Chief Veterinary Officer, NT Department of Resources.

Water Treatment

Various methods are available for improving water quality to acceptable limits. However, these are relatively expensive and may be uneconomical for stock supplies.

Reference

For further information on Australian and New Zealand water quality guidelines for livestock visit:

www.environment.gov.au/water/quality/nwqms

Contact details:

Water Resources Branch –

Department of Natural Resources, Environment, the Arts and Sport

Palmerston - 3rd Floor Goyder Building
PO Box 496 Palmerston NT 0831
Ph: 8999 3678

Katherine - 32 Giles Street
PMB123, Katherine NT 0852
Ph: 8973 8831

Alice Springs - 1st Floor Alice Plaza, Todd Mall
PO Box 1120 Alice Springs NT 0871
Ph: 89519215

Email: Water.nretas@nt.gov.au
(South) Wateradvisorysouth.nreta@nt.gov.au

Web: www.nt.gov.au/nretas/water