

Water requirements for sheep and cattle

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Warning

Chemical residues and pollutants

Contamination of water supplies by chemicals and other pollutants is a risk, particularly in mixed farming areas, where the use of pesticides and herbicides is common.

Producers should be aware of the risks involved in the use or misuse of these compounds. Contamination of ground water or catchment areas could lead to intake of chemicals by stock and wildlife. While there may not be any direct toxic effect on the stock, some chemicals can stay in the animal as residues which may render the produce of that animal unfit for consumption and expose the owner to the cost and inconvenience of quarantine or prosecution or both.

Introduction

Water is an essential nutrient for all animals. It is important for both animal welfare and business profitability that sheep and cattle have an adequate supply of good quality water. Amount and quality of water required vary between species of livestock, between classes of stock within the species, and in response to the environment in which the stock are running. This Agfact describes the factors affecting the water needs of stock and suggests likely consumption and quality requirements.

The **suitability of water for stock use** is determined by the following factors:

- **water quality**, which includes salinity, acidity, pollution and algal growth;
- **environmental factors** such as air temperature and feed quality;
- **animal factors**, which include breed differences and age and condition of stock.

Water quality

Quality of water is broadly defined as its fitness for consumption by livestock to maintain satisfactory production. The **principal factors affecting water quality** are as follows.

Salinity

The main factor which determines the suitability of water for stock is the **concentration of dissolved salts in the water**. Dissolved salts in water are expressed in parts per million (ppm) or in terms of the electrical conductivity of the water, measured in millisiemens per metre (mS/m). **Maximum advisable levels** are shown in Table 1 (1 mS/m is equivalent to about 6.4 ppm).

Generally, surface waters are low in salts compared with artesian or underground water.

Many factors influence the concentration of salts that animals can tolerate in their drinking water. Salinity increases the intake of water by animals, partly through the taste and partly to allow greater water turnover so that the body can regulate the salt balance.

Table 1. Tolerances of livestock to total dissolved solids (salinity) in drinking water (mg/L)

Livestock	No adverse effects on animals expected	Animals may have initial reluctance to drink or there may be some scouring, but stock should adapt without loss of production.	Loss of production and decline in animal condition and health would be expected. Stock may tolerate these levels for short periods if introduced gradually.
Beef cattle	0–4000	4000–5000	5000–10 000
Dairy cattle	0–2500	2500–4000	4000–7000
Sheep	0–4000	4000–10 000	10 000–13 000 ^(a)
Horses	0–4000	4000–6000	6000–7000
Pigs	0–4000	4000–6000	6000–8000
Poultry	0–2000	2000–3000	3000–4000

(a) Sheep on lush green feed may tolerate up to 13 000 mg/L TDS (total dissolved solids) without loss of condition or production.

Reference: ANZECC and ARMCANZ (2000), adapted from ANZECC (1992).

Acidity or alkalinity (pH)

Water with a pH value below 6.5 (acid) or above 8.5 (alkaline) can **cause digestive upsets** in stock, resulting in rejection of the water, depressed appetite and consequent loss of production. If this problem is present, animals may perish, even when they apparently have adequate water.

Adding alum can correct high pH, but this should be undertaken with care as alum is highly acidic. Likewise, water with a pH below 6.5 can be treated by adding lime.

Toxic elements and compounds

Water is a potential source of important minerals and other compounds. However, the **concentration of these substances can reach toxic levels**, particularly in underground water.

There are a number of elements which, if present in high enough concentrations, **can lower livestock productivity**. These include iron, magnesium, arsenic, lead, mercury, selenium and the fluorides. Where productivity losses are suspected, the problem can be investigated by a veterinarian or livestock adviser. Such an investigation would include a detailed water analysis, combined with an examination of affected stock.

Algae growth or bloom

Some species of algae found in still, fresh water **can be toxic to livestock** if temperature, water nutrient levels and wind conditions combine to produce large masses of algae growth.

Environmental factors

Temperature

In **hot weather**, animals use more water for **evaporative cooling**. For example, shearing increases the heat load on sheep in summer because the insulation formerly provided by the fleece is lost. The sheep adjust to this heat load by increasing evaporative cooling through panting. Water consumption can increase by 78 per cent under extreme conditions. The provision of shade will largely relieve this situation. In normal conditions with good quality water, consumption in summer will be about 40 per cent higher than in winter. However, with salty water the summer intake may be 50 to 80 per cent higher than consumption in the cooler months.

The amount of water that stock drink also depends on the **temperature of the water**. Generally, animals prefer water at or below body temperature and avoid warmer water. Cool water is preferred in hot conditions.

Marginal quality water may become unsatisfactory during summer because animals drink more due to the high temperatures and drier pasture. The salinity of some water may also increase because of evaporation from troughs, bore drains and shallow tanks.

Drought

During drought, **stock require more water** as they are forced to select more fibrous and less digestible feed. This extra water is used to maintain the movement of the coarse feed in the gut. As drought worsens and stock become weaker, marginal waters may become unsuitable as the animals' tolerance of the salt decreases.

Feeding salt or salt-based licks or blocks during dry periods increases water intake. If water quality is marginal, this added salt intake may depress appetite and cause digestive upsets — the opposite of the supplement's purpose.

Pasture composition

The diet of stock has a large influence on their water requirement. **Good green pasture** can supply all of an animal's water needs. Sheep under these conditions may not need to drink for many weeks.

Good pasture allows stock to use water which would normally be unsuitable at higher levels of consumption. Stock on dry pasture need increased water consumption to utilise the less digestible fodder.

In pastoral areas, stock grazing saltbush or other chenopod plants require large quantities of relatively low-salinity water. This is because of the high level of salt in the diet and the need for a high water turnover to maintain the salt balance in the body.

Animal factors

Age and condition of stock

Young animals, heavily pregnant or lactating females, and aged or weakened stock are less tolerant of saline water. In weaner sheep, high salinity depresses growth rate and wool production, and causes scouring.

Breed differences

British breed sheep need about 20 per cent more water than do Merino sheep in hot weather.

Cattle of the *Bos indicus* or *Bos indicus*-infused breeds drink less water under hot conditions than do *Bos taurus* breeds (British or European breeds).

Consumption requirements

When planning water supply requirements, **allow for evaporation losses and consumption by native and feral animals**. Table 2 gives the water requirements for stock. The figures quoted for consumption have a wide range — this variation in requirements is explained in the previous text.

Table 2. Water requirements according to the type of stock and the type of grazing

Stock type	Consumption per head per day (L)
Sheep	
Weaners	2–4
Adult dry sheep	
—grassland	2–6
—saltbush	4–12
Ewes with lambs	4–10
Cattle	
Lactating cows	
—grassland	40–100
—saltbush	70–140
Young stock	25–50
Dry stock (400 kg)	35–80
Horses	40–50

Watering points

The consumption of water can be affected by the **cleanliness of the watering point**. Where the water level in an earth tank is low, animals may be forced to wade through mud to get to the water. Due to the boggy surroundings, the water becomes heavily contaminated with suspended soil and faeces, which can make stock reject the water. Also, animals in weak condition may become bogged and die.

Feral pigs can create the same effect by wallowing along the water's edge.

Such **dams should be fenced off** and the water pumped or gravitated to **temporary troughing**. This will ensure maximum use of the available water by avoiding fouling, and will remove the risk of stock losses from bogging.

Troughs used in watering systems should be drained and cleaned regularly. Algae grow in troughs, producing unpleasant odours in the water which can repel stock. Salinity also builds up due to evaporation if troughs are not drained.

The **frequency of cleaning** depends mainly on the temperature, which affects intake, and the rates of evaporation and algae growth. The type of stock will also have some influence on the frequency of cleaning, as tolerance of contamination varies according to the requirements of the particular class of stock.

Contamination of trough water **need only be very slight to cause problems** with some stock. Instances have been recorded of weaner sheep refusing water because of a thin layer of dust on the surface of an otherwise clean trough.

Care should be taken when **introducing stock to extensive paddocks or unfamiliar watering systems**. When introducing stock to a new paddock, make sure they are familiar with the location of the watering point and are drinking the water, particularly in pastoral areas. If water quality is marginal or unknown, check newly introduced stock during the first week to ensure that there is no problem.

Watering radius

In pastoral areas, **sheep** normally graze within a radius of about 2.5 km of a watering point, and **cattle** within a radius of about 5 km.

If stock require more water due to lactation, salinity or dry feed, they may need to drink more than once a day. This will reduce their foraging radius and the area of the paddock being used.

Further information

NSW Agriculture operates a water testing service. [Water sampling kits](#) are available from [NSW Agriculture district offices](#).

The information contained in this web page is based on knowledge and understanding at the time of writing - 20 December 2002 . However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Agriculture or the user's independent adviser.

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