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FACT SHEET

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Livestock water supplies

Introduction

The water intake of livestock varies greatly between species and between animals of the same species, depending on their environment, age, type of feed and production environment.

Water is the single most important component of any livestock enterprise. Livestock need water for blood circulation, food digestion, temperature control and production. Water intake occurs through eating and of course drinking.

As the body temperature of an animal increases, so do its water requirements due to fluid loss through sweating and/or panting in an effort to keep cool. This means that not only do animals need more water in hotter conditions but also when being driven or worked.

Lactation requires a huge amount of water to produce milk. A lactating female needs at least 50% more water than a dry animal. On average it takes 4 - 5 litres of water to produce 1 litre of milk. This does not take into account the requirements for the maintenance of the animal. Theoretically a dairy cow in summer on a grass based pasture needs 80 litres a day just for maintenance and 4 - 5 litres of water per litre of milk produced, thus a cow producing 35 - 40 litres of milk could drink around 250 litres of water a day!!!

Water quantity

When considering the quantity of water needed to supply livestock it is wise to make a very liberal allowance, above the peak needs of an animal, to allow for dry periods and infrastructure failure (eg busted pipe/tank). Other factors to consider are the number of animals likely to be watered on the system and the number of watering points to be used at the same time. This is important, as no matter how big your water storage is, your water distribution network (pipes and troughs) must allow sufficient flow to meet animals' needs. If animals have to wait around half the day for the trough to fill up again, then that is time that is not spent eating.

Commonly, two thirds of a grazing animals water requirement in summer comes from drinking water, but in winter up to 90% of its requirements may come from pasture. Therefore the amount of drinking water required by an animal depends on what type of feed it is eating and the ambient temperature. Below is a list of sheep feeds and the appropriate water requirements.

Winter

- Sappy green feed – no free water needed but still recommended.

Summer

- Dry feed – two and a half to three times the weight of dry matter eaten;
- Salty feeds (saltbush) – up to 14L a day for a sheep grazing a pure stand of saltbush;
- Lucerne hay (high potassium) – 9L a day.

Table 1: Normal water intakes of animals

Animal	Daily Consumption (litres a day)
Sheep - weaners	2-4
- adult dry sheep - grass land	2-6
- salt bush	4-12
- Ewes with lambs	4-10
Cattle - weaners	25-50
- dry stock	35-80
- lactating cow - grass land	40-100
- saltbush	70-140
Dairy cattle	70–250
Horses	40-50
Pigs – sow and litter	25-45
- Boar or dry sow	12-15
- grower 23 – 90 kg	3-12
Poultry (100 birds) - laying hens	33
- broilers	6-32

Note: Water consumption can vary greatly with heat, humidity, exercise, parity, diet and water quality. Allowances must also be taken for wildlife and feral animals also drinking from watering points.

Water quality

Good quality water is clean, clear, odourless and without a high mineral content. Water quality is lowered by soluble salts, algae, pollution (dead animals, bird faeces or debris) and clay (in suspension). These materials may cause the animals to refrain from drinking the water, go off their feed, lose condition, stop lactating or die from disease or toxicity.

Salinity

Sheep can tolerate higher salt concentrations than cattle but sudden changes to more saline water may cause lowered production because sheep may not drink the more saline water immediately. They may become used to it gradually through mixing it with fresh water for a few days. As the salt concentration increases, stock drink more and more of it compared with drinking fresh water. At higher salinity levels food intake will decline.

Stock grazing green feed can tolerate higher salt concentrations than the same stock on dry feed. Stock grazing saltbush or salty feeds are less tolerant to saline water than stock grazing other types of pasture.

Pregnant, lactating and young stock have a lower salt tolerance than older dry stock.

Pigs and poultry have the lowest tolerance to salt than all other types of livestock. The salinity of water must be taken into account before feeding these stock pre-prepared rations that may contain salt.

Salinity levels can be kept as low as possible by cleaning tanks before each summer and scrubbing and flushing water troughs frequently, twice a week being optimal. One investigation into sheep deaths showed evaporation in a trough had increased the salinity from 3,900 to 8,400 mg/litre in just 2 days!

Salinity levels of dams should also be checked during summer. A water testing service is available, free of charge, through your local Land Management Board for producers concerned about the salinity levels of their stock water.

Table 2 Salinity tolerances of livestock and poultry in milligrams per litre (mg/L) of total soluble salts.

Animal	Maximum concentration for healthy growth	Maximum concentration to maintain condition	Maximum concentration tolerated
Sheep	6 000	13 000	*
Beef cattle	4 000	5 000	10 000
Dairy cattle	3 000	4 000	6 000
Horses	4 000	6 000	7 000
Pigs	2 000	3 000	4 000
Poultry	2 000	3 000	3 500

*Maximum level depends on type of feed available – for example saltbush vs greenfeed.

Chemical treatment of livestock water supplies

Chemical treatment of livestock water supplies should be restricted to farm dams and tanks only. Using chemicals in water sources such as watercourses, springs, soaks, waterholes and groundwater access trenches can be detrimental to the environment, pollute groundwater resources and be ineffective for treatment of the perceived problem. Chemical use in some water sources is also illegal due to the potential harm the environment and other water users. Your local Natural Resources Management Board may have information for best managing water sources in your area.

Algae

Build up of algae in tanks and dams can not only block outlets and pipes but also taint the water. Several species of algae are toxic to stock and cause deaths from poisoning. Algae can be controlled with several chemicals, including copper sulphate, calcium hypochlorite and ferric alum.

Copper sulphate will remove phosphorous when used at a rate of 1 gram per 1,000 litres. This treatment can be used volumetrically or as a specific contact spray (often requiring re-treatment), however it can kill crustaceans, fish and other aquatic life.

Calcium hypochlorite (from swimming pool suppliers) can be used at a rate of 12 grams of 70 percent material in 1,000 litres of water. Chlorination on a large scale, such as a farm dam, is not practical however because large amounts of organic matter interfere with the disinfectant. This treatment may also kill fish and crustaceans.

Ferric alum reduces algal blooms by also removing phosphorous from the water as a precipitate. Place a block of it in a porous bag attached to a float in the dam. A rate of 50 grams per 1,000 litres is used. Ferric alum is best used as a preventative, to treat dams before likely growth of algae.

Barley straw may inhibit the growth of algae, however the mechanism of action is unknown. Barley straw is most useful when applied to dams as a preventative as it is slow acting, taking at least a month to start working. Its effect lasts about six months. Only 100 grams of straw spread on the surface per 1,000 litres of water is required.

Dead algae can settle in a dam and rot, causing putrid water or blocked pipes. Therefore, it is best to remove as much algae as possible before treatment. When toxic algal species are being treated, they will release toxins that are slow to break down, so livestock will need to be removed before treatment and kept away for 2 – 3 weeks. Dams or tanks may need to be retreated on a regular basis. It is preferable to minimise the nutrient inflow into dams and tanks to prevent the problem occurring.

A cover on water tanks will also reduce algal growth by reducing sunlight and preventing contamination by birds and their faeces.

Pollution by debris and animals

Diseases carried in by birds or animals can contaminate a water supply and can result in lowered production or deaths in animals drinking the water. A prime example of this is salmonellosis. Sound water management includes maintaining proper hygiene by regularly inspecting dams, tanks and water troughs and cleaning them.

Unusual or objectionable odours caused by dissolved gases can often be dispelled through aeration by splashing the water from the delivery pipe onto a board before it enters the tank or drinking trough. Aeration may also reduce acidity.

Cloudy or muddy water

Cloudy water is a nuisance for homestead use and may block irrigation nozzles, although it is seldom a danger to livestock drinking it.

No one method will clarify all waters, so some experimentation will be necessary.

It is recommended that, before treating water in a dam or tank, you experiment with a 200-litre (44-gallon) drum full of water to establish not only the correct amount to use, but also the best method if alum is not successful.

To settle muddy water in most cases, add alum at the rate of 50 to 75 grams per 1,000 litres (10 to 15 grams in a 200-litre drum). Dissolve the alum in a bucket first. Be careful as alum is corrosive. Spray it over the entire surface and stir the water as much as possible. If the water is acid, agricultural lime may need to be added before the alum. Add lime at half the rate at which the alum is to be used. Lime will also reduce the corrosive affect of the alum-treated water.

If alum and lime do not work, try 'Plaster of Paris' at 370 grams per 1,000 litres (mix with 10 times the weight of water before spreading or it will set eg 370 grams with 3.7 litres), or salt at 1,000 grams per 1,000 litres (only if water is not already salty), or ferric chloride at 10 grams per 1,000 litres. Gypsum at 400 grams per 1,000 litres may also be used, but avoid using it in greater amounts than this in dams as it may cause them to leak.

A wind disturbance of the dam surface may soon undo the work of the agent by stirring up more particles of clay or whatever is causing the cloudiness. A more satisfactory way of clearing the water is to have two settling tanks to be used alternately – one settling while the other is being drawn on. As one tank is emptied, it is flushed out and filled again for treatment. An outlet at the bottom is necessary for flushing. A floating take-off is advised, whether the water is being drawn from the dam or from a tank, as this ensures that the clearest water near the surface is used first.

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Author: Ben Dennis, Animal Health Officer,