

Water Quality Factors in Farm Stock Water Supply

Water supplied to farms whether from surface water sources like dams and waterway, groundwater sources like bore water or rainwater can contain:

- materials which are **physically** suspended in the water
- materials which are **chemically** dissolved in the water stock
- organisms or **biological** material.



Photo by [DFAT](#)

Whether or not they will be harmful depends upon the type, quantity and use of your water. While there are many different types of materials that can be in your water, we have attempted to summarise some main ones.

Physical Contents

Sediments

Dirt can obviously be picked up and transported in water run-off. The more vigorous the flow the greater the size and quantity of particles that can be retained within the water flow. Whether collecting water into a dam, stormwater or stream, appropriate filters should be installed before letting it enter your pump and pipes.

When the water stops flowing and particles have time to settle, finer sediments may stay in suspension for long periods of time. You can see this by the cloudiness of your water which is known as “turbidity” and it is a key test of water quality. In extreme cases, turbid water can harm animals and deposit heavy sediment on crops, reducing photosynthesis and plant growth.

In summary, high turbidity reduces water quality and can lead to:

- poor weight gain of stock and produce
- sedimentation in pipes, tanks and other equipment
- clogging of tubes in irrigation systems.

Chemical Contents

Water Salinity

All natural source of water will contain dissolved salt. Some surface or ground water sources will contain high salinity levels that can make the water unsuitable for drinking and irrigation. High salinity levels reduce the absorption of water into cells, which can lead to dehydration and a detrimental affect on plants and stock.

Water Hardness

Hardness is generally caused by the presence of calcium and magnesium salts. Water is considered to be hard when it contains these salts at levels of 100mg/L or higher. It also makes water less effective in washing and increases likelihood of "scale" build-up in pumps, irrigation pipes and filters.

In farming and domestic water supplies it is desirable to have a water hardness of less than 100 mh/L. That said, domestic or livestock consumption of hard water is generally not a problem unless magnesium salts predominate.

Plants are not directly affected, but hardness caused by bicarbonates can affect soils, thus having an indirect impact on plant growth.

Acidity/alkalinity

Acidity is measured as pH value between 7 (neutral), <6 being acidic and >8 being alkaline. If treating your water for acidity/alkalinity, it is ideal to try and keep it between pH 5.5 and pH 7. Water in this pH range:

- maintains nutrient balance
- prevents scale formation in irrigation equipment
- provides effective chemical disinfection.

Rainwater itself is normally quite acidic and between 5 – 5.6 pH. In local thunderstorms the pH can drop as low as 2.0. Acidic water can be neutralised by the use of a Calcite unit which naturally adjusts the pH to neutral.

Biological content

All surface waters will contain biological activity, however this doesn't mean it is undesirable. If using for stock and domestic use, then there are some organisms that are undesirable especially if found at excessive levels.

Algae

A high level of algae in your water supply indicates that high levels of nutrient chemicals are contaminating the water.

A wide range of algae can be found in surface water sources including:

- **green algae** – the most diverse type and may be microscopic or present as large clumps or mats of tangled filaments

- **diatoms, dinoflagellates and cryptomonads** – generally only visible under a microscope
- **blue-green algae** – also microscopic but large colonies and aggregated filaments can be visible in water.

Excessive growth of algae are known as algal blooms. All algal blooms reduce water quality by producing a bad taste, odour, blockages and stagnation of water. The most concerning are the blue-green algae since many of these are toxic and harmful to livestock.

Biological Waste and Bacteria

Farm water can be affected by biological waste from livestock urine and faeces, seepage from septic tanks, run-off from fertiliser sheds and industrial waste.

These pollutants can encourage aquatic weeds and micro-organisms such as algae and bacteria to multiply rapidly to large numbers, making the water unfit for stock, domestic or irrigation use.

Water contaminated by such is unpalatable to stock and would affect animal health. It is also both unattractive and unhealthy for domestic use. Blockage of irrigation equipment may become a serious irrigation problem.

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