

# Keeping your Farm Water Safe and Fresh



## Introduction

In many parts of the world, farmers do not have access to clean, sanitised water. Although town water supplies are treated at chlorination plants before being piped onto properties, many rural districts have to rely on ground/borehole, river water supplies or roof water collection tanks. This is the case in most parts of rural New Zealand, for example, and back in the 1990s it was estimated that around 70% of the population of NZ relied on water supplies that were not subject to standardised sanitising treatment. More recent surveys have shown that stored tank water can harbour a wide range of pathogenic organisms including bacteria, viruses and toxic blue-green algae. Such pathogens produce toxins which cause a range of problems from gastro-enteritis to neurotoxicity. In addition, water storage on farms via ponds and dams is highly susceptible to contamination due to faecal material or farm run-off entering the water. In many parts of the world, environmental legislation is now in place to try to control water contamination, however there is still much ignorance regarding the relevance of water quality to animal health and productivity.

Water quality is a major issue for all species – animals and plants can go for several days without food, but cannot last long without access to water. This makes water the number one nutrient in all diets – although it is frequently neglected and taken for granted. As such, the quality and safety of water are essential in maintaining animal health. Every summer in temperate and hotter regions, there are reports of toxic blue-green bacteria (which produce neurotoxins) posing a risk to people and animals from contamination and overgrowth in dams and rivers.

## Modern Water Sanitisers

Modern water sanitisers, such as Credence (Kiotech Agil, UK Ltd), rely on stabilised chorine technology that offers not only a fast kill rate, but also persistence in water to keep it clear for longer. The active triclosene sodium in Credence, alongside its slow-release technology, means it is effective and easy to use on farm. With each tablet containing 8.68 g triclosene sodium, this is sufficient to remove pathogens for 1000 litres of drinking water, or, at higher concentrations, be used for cleaning facilities and equipment or as biosecurity in foot and wheel baths. Credence has been trialled in many rural situations, including troughs, dams, boreholes and in feed and milk containers.

## Research on Sanitisers in Drinking Water

Research conducted in 2010 investigated the contamination of farm water troughs and dams by blue-green algae, and how these can be controlled by adding

a water sanitiser product. Samples were taken from concrete water troughs on dairy farms in the Manawatu and were shown to contain toxic blue-green algae growth. After addition of the water sanitiser Credence™, these harmful species were effectively negated after 24 hours. In addition, unlike commonly-used copper sulphate treatments, no over-production of toxins (the 'toxin burst') occurs during the kill-off of the algae, and the sanitiser had no issues regarding overloading individual minerals to the animals via the water system (Table 1).

Species	Untreated	Credence 24 hours exposure
<i>Pseudomonas</i>	Present	Undetected
<i>Campylobacter</i>	Present	Undetected
<i>Pseudanabaena</i>	1000 CFU/ml	380 CFU/ml
<i>Aphanocapsa</i>	1600 CFU/ml	Undetected
<i>Phormidium</i>	1100 CFU/ml	Undetected

Table 1. Efficacy of Credence water sanitiser on controlling pathogens in farm water troughs

Such findings are important, especially on dairy farms where pasture rotation can leave water troughs unused for several weeks, allowing stagnation and algal overgrowth. Other farming systems have different problems. Animals reared indoors rely on piped water supplies, which may contain water from unsanitised sources. Joints in pipework and around drinkers readily build up biofilms, which provide a haven for the colonisation and multiplication of toxic micro-organisms. Credence has been shown to kill off commonly-found pathogens in drinking water systems used on pig and poultry farms, including coliforms and *Aeromonas*, the latter of which causes gastroenteritis in young animals, and is linked to antibiotic-resistant necrotising fasciitis in wounds and organs.

Pathogen	Pre-treatment CFU/litre	Post-treatment (35 min) CFU/litre
Aerobic mesophilic bacteria	378,500	0
Coliforms (e.g. <i>E. coli</i> )	149	0
<i>Aeromonas hydrophila</i>	Present	No
<i>Citrobacter freundii</i>	Present	No

Table 2. Efficacy of Credence in water pipes on farm

Trials on pig farms have shown that ingested coliforms from drinking water can end up causing contamination on meat – posing a human health problem. Using Credence in water systems reduces the exposure, both from intake



and in the environment, of pigs to contaminants which can result in meat contamination. Trials have shown that, when Credence was used in water systems on pig farms, *Salmonella* contamination of carcasses was reduced from 97% of carcasses down to 25%.

#### Biosecurity on Farm

Credence has the added advantage of its flexibility for on-farm use. By increasing the concentration, Credence can be used as an effective biosecurity and sanitiser product, cleaning floors, animal facilities, equipment such as buckets and calfeterias, and for disinfecting porous surfaces. The product has been routinely used on specialist calf-rearing facilities as a sanitising agent as well as for biosecurity (wheel and foot baths). In these circumstances it is very useful as it requires minimal rinsing only, as the product in a dilute form is safe for drinking. Calves are highly susceptible to gastric disorders, especially under the age of three weeks. The complicated design of feeding equipment for calves makes them a potential vector for disease transmission, especially as busy calf-rearers may use the same feeding bottles or calfeterias between different calves. Trials whereby a dilution of Credence was externally sprayed onto the teats of individual bottles between individual calf milk feeding showed that Credence reduced the number of bacterial colony forming units (CFU) down to a negligible (0.4) amount from swabs, whereas water rinsing actually concentrated bacteria (66 CFU) in the tips of the rubber teats, increasing CFU levels compared to the unrinsed control (38.4 CFU). Keeping bacterial levels under control is important in preventing transfer of disease between animals, and applying Credence as a simple spray to maintain cleanliness between feeding individual calves is crucial to maintaining the health status of the animals during milk intake.

For buildings, it is important to maintain hygiene standards to prevent promotion or transfer of disease. This is especially important where young, old or breeding animals (e.g. kennels) are involved. Swabs taken from animal pens and concrete-floored buildings have shown that up to 75% of swabs analysed via microbiological methods were classified as highly contaminated. In fact,

following basic washdown procedures, no swabs were clear of microbial contamination. However, with Credence used in washdown, around 50% of the swabs were clear of any contamination, vastly reducing the potential for exposure of animals to pathogens. Likewise, in feed and water containers, contamination, even in rinsed vessels, can still be high, with up to 70% of swabs showing a high degree of CFU. When rinsed with Credence, only around 10% of swabs showed any bacterial contamination.

Viruses are a major problem, as they are much more difficult to treat in affected animals. Suitable biosecurity and cleaning regimens are essential to prevent the development of disease. For example, rotavirus is a major disease problem in young animals, especially calves, and parvovirus is a dangerous problem in young dogs in vet clinics and kennels. Controlled laboratory trials on the control of viruses by Credence have been carried out, and demonstrate that it provides good control against both of these viruses, reducing viable viral counts to zero.

#### Conclusions

Using an effective disinfectant and water sanitiser on farm or with various animal enterprises is important in maintaining animal health, productivity and welfare. However, most products are either for only drinking water or sanitation or biosecurity. Credence has the flexibility and safety to be used in different concentrations to satisfy a variety of purposes in animal production and rearing. From keeping concrete yards clear of slippery algae, to preventing toxic pathogenic growth in drinking water and for hygienically cleaning down facilities and equipment – Credence is adaptable and easy to use in all these situations. In addition, it is typically much more cost-effective compared to alternatives in the market, and requires less rinsing or concerns regarding toxicity to animals for any remaining active compound.



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