

A large, light orange graphic consisting of a circle with a smaller circle inside it, and a house-like shape in the center. The house shape is composed of several lines forming a roof and two rectangular sections.

Final Report Summary

Industry Best Practice Manual for Water
Quality Management and Sterilisation



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Background

The chicken meat industry requires reliable supplies of safe high-quality water for meat chicken production. The quality of water used in production plays a major role in flock performance via the effect on digestion and absorption of nutrients. Furthermore, water can be a carrier of avian diseases and hazardous microbial and chemicals contaminants. There are two major interrelated factors that determine the quality of farm water:

1. Water source quality
2. On-farm distribution system effects.

This project therefore considered both water source and on-farm distribution system water quality issues, pre-sanitisation treatment methods, sanitisation methods and on-farm water distribution system water quality management practices. The findings of this research were summarised into an industry best practice manual for water quality management and sanitisation on-farm.

Objectives

- 1 Review potential water pre-sanitisation treatments that could be used to increase water quality (practical pre-treatments, for example: ceramic filters, PPE filters, sand filters, GAC, PAC, resins, BAG and ozone, coagulation, ultra-filtration, nano-filtration and reverse osmosis etc) that meet industry requirements for water quality.
- 2 Review sanitisation treatment methods (practical low-cost sanitisation, for example: chlorine, chloramines, hydrogen peroxide, chlorine dioxide (liquid), ozone, UV, potassium permanganate etc) that meet industry requirements for water quality. Additionally, water treatment additives (i.e. for acidification, pH buffering/stabilisation) will be reviewed.
- 3 Review on-farm water distribution system quality management practices (for example: flushing, shock chlorination etc) that meet industry requirements for water quality.
- 4 Identify best practice management and document this in a manual for industry.

The project completed a review of pre-sanitisation treatments, sanitisation treatments, water treatment additives and on-farm water distribution quality control methods - that meet the needs of industry, and from this review provided recommendations around best practice methods for water quality management and sterilisation for the chicken meat industry.

Research

During the initial stage of the project, Integrity Ag & Environment conducted a targeted survey aimed at growers, service personnel, poultry health experts and nutritionists to identify key water quality related issues for chicken meat production.

The project team subsequently reviewed: Water quality issues such as source water quality (microbial, chemical), on-farm distribution system (drinking vs cooling pad water quality, microbial chemical), water medications (vitamin C, etc); water treatment methods including pre-treatment, sanitisation treatment, additive treatment; and on-farm water distribution system water quality management practices such as the shed distribution system and flushing.

Based on the findings of this research, best practice management strategies for water quality issues, were developed and documented for use by industry, including sections on water quality issues, water quality criteria, pre-treatment methods, water sanitisation methods and best practice management strategies.

Implications for industry

The best practice manual for water quality management and sterilisation details measures that can be used by industry to ensure that water quality issues which affect farm performance are minimised. This improves the resilience of industry in the face of changing access to high quality water resources.

Key findings

The key water quality issues identified on Australian meat chicken farms were:

- High mineral / salts content causing scale
- Blackwater events
- Microbial contamination
- High organic matter
- Algae blooms
- Weather events causing water quality issues
- Supply shortfall
- High iron or manganese concentrations,
- Maintaining residual disinfectant
- Variable water quality
- Uncertainty of disinfection
- Equipment failure
- Biofilms from medications and antibiotics
- Biofilms from diet oil additives
- Microbial failure

To address these issues specific measures are given regarding the identification of quality water sources, regular monitoring of intake water, pre-treatment, disinfection, and management of the water distribution system.

A troubleshooting guide and standard operating procedures for critical controls was developed and is available via agrifutures.com.au/bpm-water-quality-management-and-sterilisation-on-farm.



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