

# Project Summary

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## Parasitism and control strategies in domesticated buffalo populations of Australia

Of the endemic diseases that affect livestock in Australia, parasitic diseases have the most substantial financial impact on farm productivity. It is estimated that losses total as much as \$2.1 billion annually across animal industries.

Internal parasites cause significant losses through preventative treatment costs and decreased production. Although physiologically different, water buffalo can host the same parasitic species as sheep and cattle. Globally, few previous publications have detailed the prevalence or effects of parasitism in dairy and meat

buffalo. In Australia, research has been restricted to wild populations. The investigation into parasitism in water buffalo is warranted due to the lack of readily available information detailing prevalence and control measures in Australia's domestic buffalo populations.

This Project described the current state of gastrointestinal parasitism on water buffalo farms, detailing current farm practices, demographics of water buffalo populations, and how these characteristics affect parasite infection.

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### Summary

The principal aim of this project is to:

- Identify intestinal parasite species infecting Australian buffaloes using advanced morphological and molecular tools, and to also estimate the prevalence of these parasites in Australian buffalo herds.
- Optimise molecular tools for the identification of parasites hosted by buffalo.
- Assess practices (risk factors) that affect the prevalence of parasite positive buffalo in extensive grazing operations of northern and southern Australia.
- Compare and contrast parasite-host/species relationships in buffalo and other common ruminant species.



**Gastrointestinal parasitism causes significant production losses to ruminant livestock enterprises in Australia; however, there is very little known about the effects of parasitism on water buffalo. This project arises from the need for extension material relating to animal health on water buffalo farms.**



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## Background

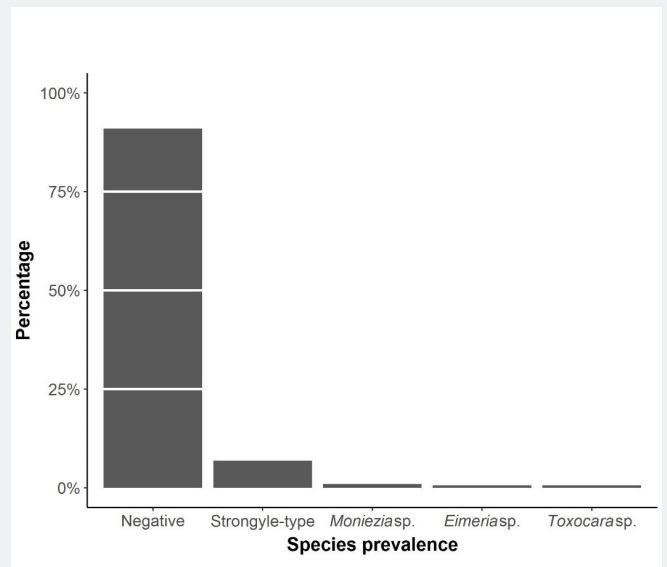
Gastrointestinal parasitism causes significant production losses to ruminant livestock enterprises in Australia; however, there is very little known about the effects of parasitism on water buffalo. This project arises from the need for extension material relating to animal health on water buffalo farms.

## Research

The project consisted of three main factors to achieve the proposed aims. Firstly, farmers were asked to complete a buffalo management survey. The survey was designed to determine current farm management practices, physical farm conditions, and local climatic information. Questions were developed with a focus on farm practices that may influence parasite infection in their buffaloes and other animals. At the completion of surveying, farms in Eastern Australia (northern Queensland to Victoria) were selected for faecal sampling and all available water buffalo on-farm were sampled from. Faecal egg counts (FECs) were then performed. These faecal egg counts indicated the current frequency of gastrointestinal nematode infection in eastern Australia. Using the farmer survey and FEC data, farming structures, management, and parasite prevalence was described. Parasite positive samples were cultured and the resulting larvae with identified using morphological and molecular techniques. These larvae were then compared to parasites common to other ruminant livestock in Australia.

## Outcomes

The outcomes of this study concluded that water buffalo in Australia have a relatively low parasite burden when compared to other domestic ruminant species. The species of gastrointestinal nematodes water buffalo host appear to be different to those of sheep and cattle. Of note, are the novel parasite sequences that were identified during the molecular identification of the parasite. The ramifications of this are currently unknown. Novel parasites may be a threat to naïve ruminant hosts, being more pathogenic and impacting on production. It is possible that these parasites are present in ruminant livestock systems but have been previously misidentified. Also worthy of mention, *Toxocara vitulorum* was identified in water buffalo calves. *T. vitulorum* may cause significant morbidity and mortality in water buffalo calves. Due to its lifecycle, fecundity and resilient eggs, *T. vitulorum* is easily perpetuated through a system and can be difficult to remove.



**Figure 1**

Prevalence of parasite infection in faecal samples obtained from water buffalo

A low level of parasitism was observed on all farms, therefore, intervention either through capital input (anthelmintics) or increased labour (rotational grazing or spelling) is of little value. Water buffalo on farms in Australia appear to be refractory to infection with gastrointestinal nematodes. The low parasite prevalence indicated by the faecal egg survey, and the high body condition scores recorded, suggest most water buffalo on farms in Australia are not negatively affected by gastrointestinal nematodes in a manner that would impact sheep or cattle. Young water buffalo had higher infections than adult individuals, and some exhibited clinical signs of parasite infection such as ill-thrift, diarrhoea, and poor coat condition. The mitigation of parasite infection in young livestock may prevent mortality and lead to increased performance in the long term.

## Implications

The new data presented in this study is necessary to begin to develop control and management strategies for parasitism of domestic water buffalo. For the water buffalo industry in Australia, the outcomes of this project detail specific management practices where input cost may not be warranted.

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The identification of novel parasite species warrants further investigation and may pose some risk to farm production; however, given the health status of most water buffalo on the sampled farms, this seems unlikely. The host specificity of the identified parasites must may also impact biosecurity due to the potential to infect sheep and cattle populations.

Due to the overall outcomes of this report the foreseeable implications to the water buffalo industry are low. With the presented information, extension material has been produced to better inform water-buffalo farmers of gastrointestinal nematodes on their farm. Using the recommendations from the extension material, a water buffalo farmer may opt to reduce anthelmintic applications, minimising veterinary costs (due to the requirements for off-label chemical applications) and chemical costs.

### Acknowledgements

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## Further information

### Final report

*Parasitism and control strategies in domesticated buffalo populations of Australia*

### Fact sheet

*Management of gastrointestinal nematodes in water buffalo - details management guidance to achieve integrated parasite control in Australian buffalo*

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### Contact

#### Shokoofeh Shamsi

Charles Sturt University  
sshamsi@csu.edu.au

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