Terms of Reference

Transmission and epidemiology of Theileria orientalis group

Summary

Meat & Livestock Australia (MLA) is seeking Preliminary Proposals from individuals, organisations or project teams with the capability to undertake an investigation into the epidemiology of Bovine Anaemia due to the *Theileria orientalis* Group (BATOG) in Western Australia (WA).

The Western Australian Livestock Research Council (WALRC) has included "Define the problem of 'Albany Tick' and the impact potential of *Theileria*, cost to industry and management strategy" in their list of R&D priorities for the 2018/19 open call.

Much can be learnt from experience in eastern Australia, where BATOG emerged as a new disease more than ten years ago. What is still unclear in WA, where clinical cases are a relatively recent phenomenon, is the extent of *T orientalis* infection in cattle, and the distribution of *Haemaphysalis longicornis*, the three-host tick shown to be a vector in eastern Australia.

Table: Key industry performance indicators addressed by this ToR

	MLA 2020	**MISP 2020**	**BISP 2020**
Pillar	Consumer and Community Support	Consumer and Community Support	Consumer and Community Support
Priority / theme	Continuous improvement of the welfare of animals in our care	Welfare of the animals within our care	Welfare of the animals within our care
Imperative / activity / program		Continuous improvement of animal welfare / Minimising the impact of endemic disease	Continuous improvement of animal welfare
KPI	Restrict % consumers limiting red meat consumption due to animal welfare concerns to 10%. Four new products including vaccines, diagnostic tests and tools to reduce the cost and welfare impact of endemic and emergency disease in Australia	Increase in community support for industry animal welfare practices on 2015 baseline	• Community sentiment monitored and activities implemented to mitigate any shifts in perceptions and attitudes towards industry. • EAD response strategy in place with timely and effective implementation as issues arise.

Background

BATOG is now regarded as endemic to the Eastern seaboard of Australia since clinical cases were first investigated in late 2006. But in WA, where there are beef herds which are considered still to be free from the disease, and hence vulnerable to incursion, BATOG is still regarded as an emerging disease. Stringent biosecurity seems to be the only means of preventing new incursions. Cattle

producers in WA need to be better informed on the risk they run when introducing new cattle to their properties, be it for agistment, or for stock replacements. Could the new cattle potentially be carrying the disease, or the vector?

Theileria is a tick-borne protozoon, and even if cattle are diligently de-ticked prior to introduction, they might still be sub-clinically infected, and thus able to infect the resident tick population on the destination property. These ticks can then proceed to infect the naïve cattle. The prevalence and geographic distribution of *T orientalis* infection in cattle in WA are unclear. A PCR survey in eastern Australia in 2010/11 investigated the prevalence of the three recognized types of *T orientalis* (MLA project B.AHE.0038). Ikeda is the type consistently found in clinical cases of the disease, whereas Chitose is less so, whilst Buffeli is regarded as benign or non-pathogenic. The PCR diagnostic test was further refined in project B.AHE.0213.

At least one tick vector (*Haemaphysalis longicornis*, Bush tick) has been confirmed in Australia, but there may be others (project B.AHE.0240). Because they are multi-host ticks, they can survive in the environment in the absence of cattle, feeding on ground-dwelling animals or birds. Larvae and nymphs drop off to moult after completing their blood meals from different hosts, whereas engorged adult females drop off to lay eggs; each parasitic stage remains on the host for only 5 – 7 days. *H longicornis* is known to occur in WA, but its geographic distribution needs to be elucidated.

Objective

MLA is seeking expressions of interest to conduct surveys of the prevalence and distribution of the *T orientalis* types in WA cattle, and of the geographic distribution of *H longicornis*, and other potential vector ticks, e.g. *Haemaphysalis bancrofti*.

Scope

The work will be confined to WA and only grassfed beef cattle will be included in the survey for *T orientalis* types (it is foreseen that PCR will be used as the diagnostic method of choice). The tick distribution survey will concentrate on zones where the grassfed beef population densities are highest. Whereas the the *T orientalis* prevalence survey could probably be concluded within 12 – 18 months, it is likely that the tick survey might require up to three summers to ensure adequate coverage.

Output/s

The project will deliver a report on the prevalence and distribution of the three types of *T orientalis*, and of the geographic distribution of *H longicornis* in WA, with sufficient resolution to allow informed risk assessment.

Outcome/s

Beef producers in WA currently free from BATOG will be able to assess the risk of inadvertently acquiring the disease in introduced cattle, based on the new information on prevalence and geographic distribution, both of the infection and the vector.

Proposed budget and timeframe

It is expected that this project can be completed within three years. Proposals will be considered on their merit and the costs compared with the deliverables to give a value for money estimate.

Confidentiality and intellectual property

Successful projects will be funded with grassfed beef levies.

Applicants must identify any background intellectual property (IP) they bring to the project. All data and cited references must be acknowledged appropriately in the final publication and it is the sole responsibility of the applicant to ensure copyright laws are not breached.

Where further information is available which may assist the successful applicant in meeting the requirements of the project, MLA will provide such information to the successful applicant.

The successful applicant will be required to enter into a standard agreement with MLA.

MLA will share and discuss this proposal with producers, technical experts, other research organisations and research and development corporations. Please acknowledge this freedom to operate.

Deadline for submissions

Preliminary proposals must be received by MLA before 6.00pm (NSW time) Monday, 30 October 2017. Late proposals will not be accepted.

Use the preliminary proposal template to submit proposals electronically to MLA at: projectcall@mla.com.au

Preliminary Proposals will be acknowledged and recorded on the MLA project information system. Applicants will be advised in writing of the success or failure of their Preliminary Proposal in January 2018.

Further information

If you have questions regarding these terms of reference, contact:

Dr Johann Schröder
Project Manager - Animal Health and Biosecurity
Telephone: 07 3620 5202
Email: jschroder@mla.com.au