

## Terms of Reference

### ***Scope the potential for vaccines against the important gastrointestinal nematodes of sheep and goats***

#### Summary

Meat & Livestock Australia (MLA) is seeking Preliminary Proposals from individuals, organisations or project teams with the capability to review the literature, consider modern scientific advances and propose prospective lines of research in the area of the control of nematodes using vaccines. In addition are there novel technologies that could be adapted to save labour in routine anthelmintic administration.

**Table: Key industry performance indicators addressed by this ToR**

	MLA 2020	MISP 2020	SISP 2020
<b>Pillar</b>	Consumer and Community Support	Consumer and Community Support	
<b>Priority / theme</b>	Continuous improvement of the welfare of animals in our care	Welfare of the animals within our care	Wellbeing of the animals within our care
<b>Imperative / activity / program</b>		Continuous improvement of animal welfare / Minimising the impact of endemic disease	Continuous improvement of animal welfare / Minimising the impact of endemic disease
<b>KPI</b>	<p>Restrict % consumers limiting red meat consumption due to animal welfare concerns to 10%.</p> <p>Four new products including vaccines, diagnostic tests and tools to reduce the cost and welfare impact of endemic and emergency disease in Australia</p>	Increase in community support for industry animal welfare practices on 2015 baseline	<ul style="list-style-type: none"> <li>• Monitor and actively respond to community perceptions and concerns about sheep industry practices across the entire supply chain.</li> <li>• Collaborate with state (industry and government) extension networks and the LBN or equivalent to promote better practices in animal health and wellbeing to producers.</li> <li>• Achieve enhanced animal welfare outcomes through the adoption of consistent, science-based practices.</li> <li>• Undertake RD&amp;E to reduce the risk of compromised wellbeing of sheep and develop enhanced husbandry and management procedures.</li> </ul>

#### Background

MLA has a regional consultation framework for directing research, development and adoption (RD&A) investment for grassfed beef and sheepmeat levies. These producer panels have identified the following needs and gaps in the MLA R&D portfolio in the area of health and welfare:

- Methods preventing the need for mulesing by addressing the causes and prevention of

- scouring.
- Innovative solutions and novel delivery methods for internal and external parasite management.

Internal parasites are one of the main diseases of sheep in Australia costing \$342M p.a. in production losses and \$94M p.a. in control costs (Priority list of endemic diseases MLA project B.AHE.0010, Lane *et al* 2015). Further, they cause significant economic losses and mortality in the 2B small ruminants largely run in groups of 2 - 5 by small holders in Africa and Asia whilst attracting minimal expenditure on control. An effective vaccine against *Haemonchus contortus* has recently been commercialised by Moredun Research Institute in Australia. Vaccines against *Teladorsagia circumcincta* may also be in view. However *Trichostrongylus spp* cause great losses and are not the current focus of vaccine discovery efforts. Further, anthelmintic resistance is on the rise in all three species and integrated parasite management imperatives require alternatives to anthelmintics.

The last 20 years have seen the molecular genetic characterisation of model and economic nematodes, genetic tools have developed enormously and the understanding of host genetics and immune responses have also burgeoned. However sheep and goats do not attract large pharmaceutical company investment, most of the sheep and goats in the world are owned by small operators and gaps occur in research into control measures of important diseases. Is there an opportunity to revisit vaccines into gastrointestinal nematodes of small ruminants in particular *Trichostrongylus* species?

## Objectives

Meat & Livestock Australia is seeking to commission a literature review of vaccines and current research against the important gastrointestinal nematodes of sheep. In addition are there novel technologies that could be adapted to save labour in routine anthelmintic administration?

- To scope the potential for new research in light of modern molecular genetic and immunological advances of the host x parasite interaction.
- Identify prospective areas of work with a view to developing vaccines useful to Australian producers and potentially to small holders in the 3<sup>rd</sup> world.
- To develop and maintain capacity and capability in gastrointestinal parasite research.
- Identify novel labour saving technologies for sheep internal parasite control

## Scope

MLA is seeking collaborative, proposals to undertake this research. Proposals should indicate:

- Team membership and responsibilities, collaboration between different groups is encouraged
- Demonstrated understanding, experience in and knowledge of the issues to be addressed
- Budget showing detailed costs (cash and in-kind)
- Detailed timeline for delivery of the project.
- The project is to develop the scope of future work and protagonists need to think about the future budgets and indeed funding approaches.

## Output/s

- A comprehensive literature review of the field.
- Clear and succinct recommendations for further research and an idea of likely budgets.
- Stage 1 of a large program of work.

## **Outcome/s**

The red meat industry will be well placed to sponsor further R&D into the principle internal parasitic diseases of sheep with a realistic assessment of the likelihood of success long term.

## **Proposed budget and timeframe**

MLA would expect a detailed literature review and scoping of future recommendations for <\$100,000 AUD.

## **Confidentiality and intellectual property**

Successful projects will be funded with sheepmeat 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](mailto: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:

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