

## Expressions of Interest – Terms of Reference

### Odour measurement and modelling of covered housing systems for feedlot cattle

#### Summary:

Meat & Livestock Australia (MLA) is seeking expressions of interest from organizations with the capability to deliver R&D on odour measurement and modelling on covered housing systems for feedlot cattle in different geographic regions of Australia.

#### Background:

Covered housing systems are an emerging concept in Australian feedlot design. Covered housing is usually favored in more extreme climatic conditions where adverse weather conditions impact the cleanliness and welfare of cattle. There are a range of designs available, and, new, lower cost alternatives are emerging, increasing the attractiveness and enabling widespread adoption of covered housing by the Australian feedlot industry.

When designing and constructing covered housing systems the main aims are to:

- provide a housing environment for cattle where animal welfare and protection from the environment are maximised
- provide a housing environment that maximises production performance of cattle and is functional from perspectives of feed management, livestock handling and manure management
- promote safe access for cattle to and from the feeding pens
- be structurally sound
- promote good natural ventilation
- optimise the management and removal of manure and spent bedding from the pens
- minimise ongoing maintenance costs
- provide a safe working environment for people

One gap that has been identified by stakeholders and industry is the lack of separation distance guidelines for covered housing systems in different geographic areas of Australia. The use of separation or buffer distances is well established and widely recognized means of mitigating the impacts on community amenity that arise from odour, dust, noise and other emissions from beef cattle feedlots. Good siting, design, construction and management are all important in preventing impacts and minimizing risks to environmental and community amenity.

Odour emissions from feedlots are related to factors such as depth of manure on the pen surface and moisture content. These are in turn related to factors such as climatic conditions at the site, pen cleaning frequency and stocking density. Covered housing systems remove the rainfall component and therefore odour will largely be the result of bedding management and stocking density. It may therefore be possible to establish a range of covered housing separation factors for different bedding management and stocking densities.

The aim of this program of work is to undertake detailed odour measurements and dispersion modelling at different sites with covered housing systems to begin to develop this matrix of separation factors that can be used for feedlot development applications. These may subsequently be used to

aided development applications for retrofitting existing feedlot pens with covered housing, expansion to existing feedlots with covered housing or construction of greenfield covered housing feedlots.

**Project objectives:**

Deliver to MLA by the agreed date:

1. Results from odour measurements from up to 10 covered housing systems feedlots in different geographic regions of Australia.
2. Results from odour dispersion modelling from the same covered housing feedlot systems in (1)
3. Obtain various odour measurements to show changes in odour emissions based on design/management changes.
4. Development of separation<sub>1</sub> factor matrix for bedding management x stocking density for covered housing feedlot systems using the odour dispersion modelling results.

**Process:**

Expressions of interest: Applicants submit a preliminary application, utilizing the MLA Preliminary Application form (see below), addressing the Terms of Reference. Proposals will be scored against the selection criterion set out in this Terms of Reference. Preliminary applications must not exceed six (6) pages. MLA will acknowledge receipt of each application. Applicants will be advised in writing of the success or failure of their preliminary application.

**Brief project design and methods:**

This project will involve close consultation with MLA, industry stakeholders and relevant state and federal regulatory authorities to address necessary concerns and provide results that are applicable industry wide.

General information on covered housing systems can be found in the MLA feedlot design and construction manual: <https://www.mla.com.au/globalassets/mla-corporate/research-and-development/program-areas/feeding-finishing-and-nutrition/feedlot-design-manual/design-manual.pdf> and the national guidelines for beef cattle feedlots in Australia: <https://futurebeef.com.au/wp-content/uploads/National-guidelines-for-beef-cattle-feedlots-in-Australia-third-edition.pdf>

The primary objective of the proposed project would be to undertake or oversee odour measurement and odour dispersion modelling from up to 10 covered housing systems feedlots in different geographical areas of Australia. The measurements at each site can occur under its current management conditions. Sites should be selected such that they cover a range of design and management scenarios (from high density, intensive bedding management through to lower density, minimal bedding management).

In the EOI, please include details on the following:

1. The objective of the odour measurement program
2. Justification of sampling method in relation to measurement objective
3. Considerations for olfactory testing and analysis:
  - a. how 'worst case' normal operating conditions were captured by sampling
  - b. confirmation of sampling methodology and protocols (what standards were used)
  - c. confirmation of what, if any, sample dilution was used during sample collection
  - d. laboratory where olfactometry undertaken
  - e. confirmation of method used (Australian Standard 4323.3:2001 Stationary Source Emissions - Determination of Odour Concentration by Dynamic Olfactometry is the preferred method); to ensure rigorous quality assurance and quality control

- procedures are adhered to when using these methods, consultants should generally be accredited by the National Association of Testing Authorities (NATA)
- f. time between sample collection and olfactometry analysis
  - g. number of panelists and identification code of each
  - h. certified reference material used, and its concentration
  - i. result matrices for odour intensity analyses
  - j. plot of the odour intensity-concentration relationship(s).
4. The objective of the odour dispersion modelling program
    - a. Site plan – layout, identification of emissions sources, receptors and topography
    - b. Site activities – processes, inputs and outputs from the site
    - c. Meteorological data – dispersion meteorology, wind, ambient temp. QA in place for data source and collection
    - d. Emission inventory – odour emission rates, site specific data, methodologies,
    - e. Dispersion modelling – discussion and justification of parameters used in the modeling and modelling with  $s_2$ - $s_5$  factors, discussion of odour impacts at receptors
  5. The covered housing structures (sites) that R&D will be undertaken.
  6. How each of the objectives will be addressed by your R&D.

**Timing:**

The timing of delivery of outcomes for each successful applicant will be subject to negotiation between MLA and the successful applicant. Delivery timeline is a selection criterion at both stages of application assessment and speed to delivery outcomes for commercial industry will be viewed positively.

**Budget:**

There is no set budget for the total project, however, applicants should deliver a fully justified budget to achieve project objectives. Value for money is a selection criterion at application assessment.

**Confidentiality:**

By submitting an expression of interest, the applicant will disclose information in the preliminary application form to MLA's employees, agents, contractors and advisors, for the purposes of this tender process and any legal or MLA policy requirement. Applicants must identify any information that they consider should be protected as confidential information and provide reasons for this.

**Conflict of interest:**

Applicants, research teams or subcontractors with any potential conflicts of interest, should thoroughly outline these in this application, including how they propose to manage them, if applicable.

**Selection criteria:**

Stage 1 - Expressions of Interest applications will be reviewed by Meat & Livestock Australia, and selection will be based on assessment against the following criteria:

1. Background of proposed work
2. Outputs, outcomes and impacts of the R&D that will be undertaken
3. Quality of brief project design and methods to achieve project objectives
4. Adequate resourcing and expertise to facilitate proposed R&D
5. Value for money of preliminary budget
6. Delivery timeline

**Project proposal submissions:**

To access the MLA Preliminary application templates (Grain-Fed, Live Export & Goats), go to <https://www.mla.com.au/research-and-development/funding-opportunities/industry-researchers/>, then navigate to the preliminary application form.

MLA applications must be lodged electronically as Word document to: [mvandersaag@mla.com.au](mailto:mvandersaag@mla.com.au)

Stage 1 MLA Preliminary Applications must be received by COB, 16<sup>th</sup> February, 2022.

Strict adherence to the time deadline for applications will occur. Applications received past the deadline will not be assessed. Applications not received in the standard MLA application template will not be assessed.

**Further information:**

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