**Expression of Interest: Terms of Reference**

**MLA Resource Flock: Satellite flocks for reproduction traits**

**Date: 18 January 2023**

**MLA Program:** Livestock Genetics

**Livestock Genetics Program Manager:** Hamish Chandler –hchandler@mla.com.au

1. **Purpose:**

Meat & Livestock Australia (MLA) are seeking breeders to collaborate and co-invest with the MLA Resource Flock project and contribute to the industry’s reference population by collecting reproduction traits and genotyping industry animals as a satellite flock to the MLA Resource Flock. The MLA Resource Flock is a project funded using levy funds from MLA that the University of New England (UNE) coordinates.

1. **Relevant and necessary background:**

The MLA Resource Flock collects reference data (phenotypes and genotypes) for use in genomic testing, as well as providing a resource for additional R&D projects. The data collected is used for the purpose of generating Australian Sheep Breeding Values (ASBV’s) and other genetic and genomic tools, for delivery to sheep breeders through Sheep Genetics.

Collecting data on industry relevant animals will improve the accuracy of selection for traits that are either too expensive to measure routinely, are hard-to measure or can only be measured late-in-life. These traits include lean meat yield, eating quality, disease resistance, animal welfare, reproduction, methane production and net feed intake.

The University of New England (UNE) is contracted by MLA to manage the MLA Resource Flock project.

A key component of the Resource Flock project this year is to seek additional co-investment from industry into the collection of genotypes matched to phenotypes for reproduction traits on maiden ewes from Sheep Genetics (non-research) flocks, known as satellite flocks. Data from under-represented flocks and breeds will be preferred, with **Terminal breeders collecting reproduction data of interest**. In particular breeds that are part of the Terminal LAMBPLAN analysis however are used in self-replacing flocks e.g. Dorper etc or where daughters are retained and bred from e.g. White Suffolks. These satellite flocks will need to demonstrate an ability to meet selection criteria for items such as additional co-investment through in-kind resources and the ability to meet data quality standards.

The sequence of events for successful Expressions of Interest will be:

Collect on farm reproduction data on the nominated animals as described in this document

Genotype the entire cohort of animals (maiden ewes) to measure for reproduction performance (including dry ewes)

Potential collection of methane data by MLA staff on project sheep as maidens (in 2023) or as adults (in 2024)

1. **Objective**

Increase the number of animals in the reference population for reproduction traits by measuring and genotyping industry animals in satellite flocks. Focused on, but not limited to, breeds that currently have an insufficient reference population size.

The reproduction phenotypes recorded will include:

* A DNA sample (TSU) from all ewes first mated in 2023. The ewes must be ***naturally mated*** and all ewes of the cohort must be sampled including **DRY** and pregnant ewes.
* Pre-joining weight and condition scores
* Joining dates – conception method, service sire ID, ram in ram out dates, any back up rams used, management group prior to joining
* Pregnancy scan data relevant to this group including pregnancy scanning date, operator, and management group the ewes were managed in leading into scanning. **This must be scanning for multiples not wet and dry. This is for the purpose of the project – regardless of current on-farm practices**
* Lambing data including Lamb ID, date of birth, birthweight, lambing ease, maternal behaviour score, Birth type, Rear type, DAB’s and dry ewes and lamb survival through to weaning
* Data is to be entered via the mating module in your respective software
* **All** **genotyped ewes are to be mated for a second mating the following year including the dry ewes.** This means the dry ewes genotyped from 2023 must be kept and mated again in 2024.
1. **Terms of Reference: Scope**

The project is seeking co-investment partners with ewes to collect both phenotypes and DNA samples for the 2023 lambing season **(lambing prior to Dec 2023).** There must be at least 50 maiden ewes in the cohort for that drop.

Individual breeders and/or breeder groups are invited to submit an Expression of Interest (EOI) to become a satellite flock if they meet the following requirements and information recorded on-farm. To participate, partners will need to commit to effectively manage and co-ordinate all the on-farm components of the project and ensure all requirements are met. Partners must also be open to MLA staff collecting methane data on project sheep in 2023/24.

On-farm information captured on the animals is required to be submitted by the partner to MLA via Sheep Genetics evaluation. The data must include the reproduction phenotypes listed above (in Section 3. Objective).

Preference will be given to expressions of interest (EOI) that can provide information on minor breeds or sire lines within a breed with low representation in the Resource Flock, as well as for the greatest number of fixed effects. Flocks will need to demonstrate their previous ability to have recorded this information. Applications will also be assessed on key data quality metrics.

**Methane Project**

"EAP – Selecting for More Methane Efficient Sheep P.PSH.2011”. This project aims to facilitate Australian sheep breeders to select for enteric methane emissions, enabling industry to obtain accurate estimates of genetic variation and heritability of emission traits and their correlations with other economic traits in sheep production, including feed intake. Ultimately, this will enable the Australian sheep and wool industry to achieve a permanent and cumulative 4.2% reduction (0.8 MTCO2e) in methane emissions from sheep by 2030 and 15% reduction (2.6 MtCO2e) in 2040.

Specific project objectives include the development of:

1. A reference population with methane emission and feed intake measurements on individual sheep along with their genotypes to be used for genomic prediction of breeding values for these traits and selection of future breeding animals.
2. Australian Sheep Breeding Values for methane emission of sheep with a genomic prediction accuracy of at least 50%.
3. A pipeline where all phenotypic and genomic information for methane production, including those measured by breeders, can be implemented in routine OVIS evaluations via Sheep Genetics.
4. A selection index for breeders to maximize selection efficiency, including all economically relevant traits as well as methane yield and feed intake in order to optimally balance genetic improvement for these traits.

The project is seeking expressions of interest from breeders who would like to have up to 500 of their commercial ewes measured for methane. Ewes need to have good data on lifetime performance, particularly reproduction. Preferences will be given to producers involved with the MLA Resource Flock – Satellite flocks.

**Desirable criteria**

Applications will be preferred from proposed satellite flock(s) with:

* Cohorts with progeny from at least five sires and a minimum of 50 maiden ewes
* Representation of genes within industry that have not been previously represented in the MLA Resource Flock and will be of value to the future of the sheep industry
* In the case of a large number of applications, preference may be given to applicants that have not been previously involved with satellite flocks

**Outputs and Outcomes**

Successful EOI applicants will meet agreed milestones, which will identify progress in achieving the objectives and outcomes identified in this Terms of Reference (ToR) to result in the impact of improved annual rates of genetic gain in the Australian sheep industry.

Outcomes specific to this EOI will include:

* Reference populations for reproduction for a wider population of the Australian sheep industry.
* Increased accessibility of genomic tools and technologies in the Australian sheep industry.
* Improved productivity and profitability of sheepmeat breeding enterprises that contribute to industry targets.

**Funding and Co-investment**

Successful EOI’s will be funded with sheepmeat levies and required to enter into a standard agreement with the University of New England (UNE). Project funding from UNE and MLA will include:

* + Half the cost of genotyping of satellite flock animals (this includes TSUs and the type of test will be dependent on representation of genes in the current reference population) , and
	+ Potential collection of methane data on project sheep

While the satellite flock(s) costs will include:

* information captured on-farm including pedigree, fixed effects and base traits
* half the cost of the genotype

Failure to meet requirements and timelines set by the Resource Flock staff including but not limited to TSU return deadlines, number requirements and data submission may result in additional costs for the applicant or exclusion from the project.

1. **Confidentiality and Intellectual property**

All data and cited references will be acknowledged in the MLA Resource Flock milestone(s) and final report. Any data/information collected under the satellite flock will be managed by MLA and may be used for research and development by MLA, as well as being incorporated and used in the ‘Breeding Values Services’ and any ‘National Genetics Data Platforms’, defined as below.

**Breeding Values Services** means any service which involves estimation of genetic or genomicbreeding values for cattle, goat and sheep, including without limitation the service offered which uses the analytical software currently known as BREEDPLAN and OVIS software;

**National Genetics Data Platform** means database or network of databases and analyticsinfrastructure established to store, process and enable access to, in accordance with defined IP rights, data, IP, products and tools relevant to livestock genetics;

**Submissions**

Breeders and/or breeder groups should submit the Expression of Interest Template to livestockgenetics@mla.com.au by COB on **Wednesday** **18 January 2023**.

Meat & Livestock Australia will acknowledge receipt of each application. Applicants will be advised in writing of the outcome of their expression of interest by Friday 3 February 2023.

**Further information**

For any enquiries about your eligibility or for further details on the EOI, please email Resource Flock Project Coordinator, Elise Bowen at sheepdatamanagement@gmail.com