**Expression of Interest: Terms of Reference**
**MLA Resource Flock: Satellite flocks for eating quality and carcase traits**
**Date:** 30th Aug 2019
**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 to contribute to the industry's reference population by collecting additional measures of carcase and eating quality traits from industry animals as a satellite flock to the MLA Resource Flock.

### 2. Relevant and necessary background:

The MLA Resource Flock collects reference data (phenotypes) 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 information, for delivery to sheep breeders through Sheep Genetics.

The major aim of the project is to assist in the accuracy of selection for traits that are either too expensive to measure routinely, do not yet have clear market signals, are hard-to measure or can only be measured late-in-life. These traits include lean meat yield, eating quality, disease resistance, animal welfare, fertility, methane production and net feed intake.

A key component of the Resource Flock project is to seek additional co-investment from industry into the collection of genotypes matched to hard-to measure phenotypes on progeny from commercial (non-research) flocks known as satellite flocks. 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.

### 3. Objective

The objectives of this project is to increase the number of animals in the reference population for eating quality carcase phenotypes. In particular, with preference given, but not limited to, breeds that are currently unable to utilise genomic technologies due to limited reference population size.

The eating quality and carcase phenotypes recorded as part of this project will include;
- On-farm pre-slaughter live weight (FPSWT); Pre-slaughter live weight before going to abattoir with an overnight fast
- Hot carcase weight (HCWT); weight of hot carcase immediately following slaughter
- Carcase fat depth measured at the GR (GRFAT) and C-Site (mm) (CFAT)
- Carcase eye muscle depth (mm, CEMD) and width (mm, CEMW) between 12th and 13th ribs

- pH decline (PHD), left hand portion of the m. Longissimus thoracis et lumborum (LL) LL pH decline (when temperature reaches 18)
- Intramuscular fat (IMF), intramuscular fat measured on frozen sample caudal end of LL
- Shear force (SF5), shear force on loin muscle – day 5
- Where possible additional traits or devices may be used for research and development purposes such as DEXA or hyperspectral imaging.

The collaboration with these satellite flock/s will also provide opportunity for greater rates of genetic gain for industry flocks who share genes with animals within the reference population. As the additional measures will increase the accuracy of Australian Sheep Breeding Values (ASBVs), leading to greater responses to selection decisions.

4. **Terms of Reference:**

**Scope**

The project is looking for partners to collect the data and DNA samples prior to June 2020 to contribute approximately an additional 2,000 records for carcase quantity and quality traits. Individual breeders and/or breeder groups are invited to submit an EOI if they meet the following requirements on available animals and information captured on-farm. The collaborator will be required to effectively manage and co-ordinate all the on-farm components of the project and have an existing relationship with a processor who is willing to consign the lambs at a mutually convenient time and allow collection of the required carcase data.

Available animals for slaughter are to be:
- Delivered for slaughter prior to June 2020 with estimated carcase weight between 18kg and 26kg, and fitting current lamb dentition definition
- From lambs in commercial flocks or surplus progeny from LAMBPLAN ram breeder flocks, where the sires are known
- From large contemporary group cohorts where;
    - a minimum of 2 sires represented within each cohort and at least 5 progeny per sire. Preference will be given to cohorts with more animals and sires represented
    - lambs have been born within an 8 week period of each other
    - lambs have been managed in the same mob until slaughter
- An industry representation of breeds, in particular minor breeds. A breed or sire line within a breed not heavily represented in the resource flock to date may be given preference.

The collaborator will be expected to arrange and co-ordinate the kill for lambs in consultation with the resource flock project staff. The collection of carcase data must be a supported by a meat science team approved by the MLA Resource Flock project. The meat science team allocated to collect the carcase data will be assigned based on which processor the lambs are sold to. A list of collaborating

processors will be made available upon receipt of an EOI. Loin samples for intramuscular fat and shear force must be processed by University of New England or Murdoch University.

Information captured on-farm that will be submitted by the collaborator to MLA for use in Sheep Genetics, as well as further research and development and must adhere to the Sheep Genetics Breeders Quality Assurance Manual and include:

- Information on sire and dam breeds
- Accurate management groups
- Base Traits: at least one live weight (BWT or WWT) and carcase ultrasound scan for eye muscle depth (EMD) and fat depth (FAT) with a respective live weight.
- Satellite flock data stored and submitted through one of the Sheep Genetics accepted software programs
- Collection of DNA using TSU's (resource flock project to provide TSU's and further information)

Preference will be given to expressions of interest that can provide information for the greatest number of the following fixed effects: date of birth, birth type, rear type, age of dam, flock of birth.

**Desirable criteria**

Applications will be preferred from proposed satellite flock/s with;

- Cross bred animals (in particular Merino or Maternal cross)
- Cohorts with larger sire representation
- Representation of genes within industry that are not been previously represented in the MLA Resource Flock

**Outputs and Outcomes**

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

Outputs specific to the enhanced carcase phenotypes EOI will include;

- Records, data and information that will contribute to industry through 'Breeding Value Services' and any 'National Genetics Data Platform'

Outcomes specific to the enhanced carcase phenotypes EOI will include;

- Increased accuracy for lean meat yield, eating quality and carcase ASBV's for industry flocks directly contributing genes into the satellite flock/s
- Reference populations for eating quality traits 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

**5. Confidentiality and Intellectual property**

Successful EOI's will be funded with sheepmeat levies and required to enter into a standard agreement with the University of New England (UNE) as a sub-contractor to the MLA Resource Flock project. Project funding from UNE and MLA will include;

- genotyping of satellite flock animals (this includes TSU and the type of test will be dependent on representation of genes in the current reference population), and
- half the cost of the collection of carcase and meat science traits which has an approximate cost of $150 per animal so the funding will equate to $75 per animal.

While the satellite flock/s costs will include:

- the animals for slaughter sold to a collaborating processor on a commercial basis
- management and travel costs associated with collecting DNA samples, on-farm pre-slaughter traits and preparing the satellite flock for slaughter
- Information captured on-farm including pedigree, fixed effects and base traits
- half the cost of the collection of the carcase and meat science traits (approximately $75 per animal)

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 owned 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 genomic breeding 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 analytics infrastructure 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 an Expression of Interest addressing the above selection criteria. Expressions should not exceed four pages, and are to be submitted electronically to livestockgenetics@mla.com.au by COB 30th Aug 2019.

Meat & Livestock Australia will acknowledge receipt of each application. Applicants will be advised in writing of the outcome of their expression of interest, relative to the selection criteria.

**Further information**

For any enquiries about your eligibility or for further details on the EOI, please email Peta Bradley pbradley@mla.com.au