

# Predictors of AI success

**The University of Sydney, supported by AWI and the NSW Stud Merino Breeders' Association Trust, is conducting research to determine the factors that influence the success of laparoscopic artificial insemination (AI) of sheep.**

Artificial insemination is a vital reproductive technology that underpins rates of genetic gain for seedstock producers and by extension the broader industry. This research will address the anecdotal reports of variable fertility following AI as well as possible waning adoption rates in some parts of the country. To investigate this issue, the University of Sydney team, led by Dr Jess Rickard, is collecting data on male and female factors, at many sites across Australia, over

several years and multiple AI programs.

To date, the project has been working closely with programs run by the Australian Merino Sire Evaluation Association (AMSEA) and six ram breeders across most states and ewe types, collecting data on female factors at the time of AI, including age, semen used, time of AI in relation to CIDR pull, uterine tone and intra-abdominal fat score. A subset of the actual semen used for AI in these programs is then sent to the lab for advanced semen diagnostics, including motility, morphology, concentration, DNA integrity, viability as well as membrane fluidity and acrosome integrity. These factors will then be built into a model to explain the pregnancy results obtained.

In the first two years, the project has collected semen from more than 300 sires and data on more than 25,000 ewes, forming the largest collection of sheep AI data in Australia. Another year's data is being collected during the 2022/23 joining season.

A study of this type has never been undertaken in sheep and will establish a capability to predict the success of AI programs as well as recommend new semen standards for the artificial breeding industry. This could reduce some of the risks associated with laparoscopic AI programs, increasing success rates and hopefully the adoption rate for woolgrowers. Ultimately this would ensure that woolgrowers can maximise the genetic benefits associated with using frozen-thawed semen from elite sires.

**If you are running an AI program this year with more than 500 ewes and two sires and you are interested in knowing more about the project or being involved, please get in contact with Dr Jessica Rickard.** **B**

## More information

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Professor Simon de Graaf and Dr Jess Rickard from the University of Sydney.

## Sexed semen

**Use of sexed semen in sheep breeders' AI programs is gathering momentum, with an estimated 10 ram sellers using the technology in this coming joining season.**

The outcome of the sexing is around 90 to 95% lambs of the sex chosen by

the breeder. Some breeders choose male lambs to increase ram sale numbers and overall income; others choose ewe lambs to increase the speed of building up a unique breeding ewe flock.

Prof Simon de Graaf studied the sexed semen technique during his PhD in the mid-2000s and was supported by a Sheep CRC top-up scholarship. Though highly successful in a research setting following this PhD work, commercial availability of sexed ram semen was limited until further AWI-funded projects improved the quality of sperm produced from the sexing process and refined its implementation into modern timed artificial insemination programs. Following a successful field trial in Victoria, sexed ram semen was released globally in

the late 2010s.

Australia's only sex-sorting facility is located at STgenetics in Camperdown, Victoria. Normally, rams are taken to semen collection facilities nearby, their semen sorted over the course of a day and left in liquid form before overnight road transportation to the location of the AI program to be conducted the following day. As with all artificial breeding, male-factor fertility risk is best managed by using multiple sires in a sexed semen AI program. **B**

## More information

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