RUM_011 Semen collection in small ruminants using an artificial vagina

I. OBJECTIVE

To describe a safe and reliable protocol for collecting ram or buck semen by use of an artificial vagina and a dummy mount ewe or doe, respectively.

II. DEFINITIONS

Competent - "the consistent application of knowledge and skill to the standard of performance required regarding the care and use of animals. It embodies the ability to transfer and apply knowledge and skill to new situations and environments." (NHMRC, 2013)

Dummy mount ewe / doe – also referred to as a "teaser", in the context of this document, this is a female which is used to sexually excite the ram / buck, so that a semen sample can be collected via voluntary ejaculation into an artificial vagina.

III. COMMENTS / RECOMMENDATIONS

- Use of drugs, chemicals, or biological agents: not routinely applicable.
- Impact to animal wellbeing:
  Rams / Bucks: No expected impact to health or fertility. If the general environmental conditions are not appropriate (e.g. if stressful at all) the ram / buck will not mount and ejaculate.
    - For teaching purposes, an individual ram / buck may be used for this procedure up to three times in the one day, and not more than six times in a week.

  Ewes/ Does: They may experience transient psychological stress associated with procedure, which includes handling, restraint, conspecific courtship, and copulatory interactions.
    - Always pen a group of teaser ewes or does and remove individual animals as required for mounting – small ruminants are "flock" animals, it is not acceptable to unnecessarily isolate them. Additionally, it is not acceptable to repeatedly use just one or two animals for this procedure (without rotation).
    - It is preferred that teaser are in oestrus at their time of use, however, this is not a requirement.
    - Use of teaser ewes and does must follow a routine schedule which rotates their use, and enables sufficient periods of "rest" during and between days of use.
    - Teaser ewes and does should not remain restrained in head stalls for any longer than 30 minutes at a time. This also applies to other forms of restraint used for this procedure.
- Pain relief measures: not routinely applicable.
- Required qualifications, experience or training: appropriate knowledge and skill to be able to consistently perform the tasks safely and efficiently (i.e. competency)
- This procedure may be used as a component of:
    - RUM_010 Breeding Soundness Examination of the Bull, Buck and Ram
- As routine, any health concerns should be managed following veterinary advice, as required.
- Relative to animal ethics applications, when using this SOP, the following should be described in the individual ethics application: duration and frequency of animal use, they species to which this procedure is being applied (sheep or goats), and any variation to this SOP.

IV. EQUIPMENT

- Suitable infrastructure for animal restraint (e.g. head stall)
- Rubber mat

Conditions:

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- Artificial vagina and collection funnel
- Semen collection tubes
- Thermometer
- Obstetric lubricant

V. PREPARATION

- Ensure all equipment is set up and ready to go (this includes the artificial vagina, describe below)
- The artificial vagina (AV) must be prepared prior – this is a hard plastic tube (or similar device) approximately 25cm in length and 7cm in diameter containing a rubber/silicone liner. The space between the liner and the tube is filled with warm water (40-45°C) and air via a tap mechanism. The combination of water and air is necessary to obtain a snug fit over the ram or buck's penis when it is introduced into the device. A semen collection tube connected to a collection funnel is fitted to the opposite end of the AV to which the penis will be inserted. The following video demonstrates the preparation of an AV for semen collection: https://www.youtube.com/watch?v=SxfEGkoB8h8, (de Graaf, 2018).

VI. PROCEDURE

1. A teaser ewe/doe is restrained in a head stall, or similar device.
   Ewes and does that are lead-trained may be restrained with a lead (with a handler holding onto the lead rope)
2. The ram/buck is allowed to enter the pen with the ewe and commence courtship behaviours.
3. The ram/buck will then mount the teaser, and in doing so begin to extrude its penis.
4. As the ram/buck extrudes its penis a handler gently diverts the penis away from the vagina and into the AV.
   Care must be taken to ensure the ram or buck does not sustain damage to the penis.
5. The ram/buck will ejaculate into the AV shortly thereafter and the semen will drain into the collection tube.
6. Return the animals to their respective pens/yards.
   Do not leave the ewe/doe restrained within the head stall for prolonged periods (>30 min).
   Do not leave rams/bucks unsupervised with ewes/does in confined quarters (i.e. do not leave them in the holding yards together, unsupervised).
7. Following the procedure monitor the animals for any signs of adverse events (e.g. lameness, genital trauma). If an unexpected adverse event(s) occurs take immediate action as outlined on the animal ethics webpage.

The following video demonstrates semen collection from a ram with use of a teaser and AV, which is representative of this SOP: https://www.youtube.com/watch?v=LRwNjVXL46U, (de Graaf, 2018).

VII. REFERENCES

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Version #	Reviewing AEC (note: all other relevant AECs ratify the approval)	AEC Review Date	Approval To Date
1	PCA	20/07/2022	20/07/2025

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