



GUIDELINES ON SEMEN COLLECTION BY ELECTROEJACULATION IN RELATION TO THE EXAMINATION OF RAMS FOR BREEDING

GENERAL

The examination of a ram for suitability for breeding must include a full clinical examination for signs of ill health and abnormalities, followed by detailed examination of the genitalia

Examination for breeding

- 1) Examination of rams for breeding have become a routine part of good flock health plans. All examinations of rams rely primarily on a clinical examination together with palpation and visual inspection of the external genitalia and it is generally accepted that rams should be examined annually in this way.
- 2) In addition assessment of semen is appropriate, but only in certain cases. These may include infertility investigations (flock or individual), certification (sale or export) and checking vasectomised rams after surgery.
- 3) The largest group to be considered will comprise rams or ram lambs when they enter a flock without a certificate of fertility. This is considered to be of particular importance if they are to be used early in the season or shortly after being sold.
- 4) It may also be necessary to collect semen for examination from rams:
 - where there may be early signs of testicular atrophy due to ageing
 - which have a history of some illness
 - that have sustained an injury to the genitalia
 - that have any clinical abnormality of the genitalia

Collection of semen

- 1) Semen can be collected from rams by means of an artificial vagina, but this method requires personnel experienced in the technique and the rams to be trained. It is more appropriate to use when repeated collections will be required, such as when rams are kept for semen production for artificial insemination programmes and also in some research contexts.
- 2) Electroejaculation is a method which is more widely available for semen collection under field conditions. However, since there is no licensed suitable analgesic product available for sheep the procedure should only be used when collection of a sample is really necessary i.e. not routinely and only when warranted by detection of an abnormality following physical examination; from previous medical history; for export, or for infertility investigations.

The procedure usually stimulates the production of a representative semen sample but a single unsatisfactory sample should never be considered absolute proof of infertility. Even a rested ram that has failed to produce a reasonable sample of semen at a minimum of two electroejaculations (preferably with an interval of at least seven rested days between) should never be considered sterile without the evidence of concurrent physical defects. Diagnosis on this basis should only be carried out by a veterinary surgeon with appropriate experience.

The Veterinary Surgeon's Act 1966, Schedule 3 Amendment Order 1982, permits electroejaculation to be performed only by a veterinary surgeon in the course of veterinary practice. Research workers and veterinary surgeons using electroejaculation for experimental or scientific reasons may only do so when the procedure has been appropriately licensed under Animals (Scientific Procedures) Act 1986. If in doubt, advice on experimental licence requirements must be obtained from the Home Office Animals (Scientific Procedures) Inspectorate before proceeding. In all cases, individuals who are not experienced at performing the procedure should seek advice on obtaining appropriate training from the Sheep Veterinary Society.

- 3) In order to prevent undue stress, rams should be handled quietly before and during examination procedures. There should be adequate gathering facilities and sufficient farm and veterinary staff to carry out the

procedures expeditiously. A minimum of three persons is required where the collection of semen is to take place, including an experienced stockman, a veterinary surgeon and a trained assistant. An enclosed area protected from the weather, such as a loose box, should be available in which to lay out and use the necessary equipment.

Instrumentation for electroejaculation

- 1) Bipolar rectal electrodes (probes) with integral batteries and electronic circuits are in common use. The instrument should be designed specifically for use in rams and should be cleaned and serviced regularly to ensure it is maintained in working order. The rectal probe should have an adjustable flange with which to regulate depth of penetration, according to size and breed of ram. The probe should always be held so that the electrodes at the tips are depressed ventrally in the rectum to bring the limited field into as close contact as possible with the target structures in the region of the paired ampullae of the vas deferens. Mains operated machines are also available, but are not recommended since they are inconvenient for the field use and since they can be abused to produce excessive stimulation.
- 2) Voltage output of battery models should be checked before each examination session. This can be done with a separate voltmeter or, more simply, by incorporating a warning light, set to detect the nominal operating threshold voltage. With the Ruakura models 10 volts is used routinely, but a higher voltage, not exceeding 15 volts, may be justifiable in larger adult rams. These instruments do not incorporate a voltage control and output can only be reduced by removing a battery and replacing it in the circuit with a specially provided conductor. A voltage switch of the high-medium-low variety could be incorporated into future models with advantage. Circuits with automatic timers governing the "off" periods between stimuli are on balance contraindicated since they do not permit extension of the rest period which may be advantageous when semen is being emitted.
- 3) The Ruakura probe produces a rectangular shaped wave and it is important that the corners of the wave do not have spikes. The smoother the wave form the more reliable will be the response, so it is advisable to have the circuit modified if there are any jagged edges to the wave pattern. Testing on an oscilloscope should always follow any repair to or modification of the circuit and users should be provided with addresses of appropriate electronic workshops.

Stimulation

- 1) Electroejaculation is a potentially stressful and painful procedure. Stimulation of pelvic genitalia by a rectal electrode is an imprecise technique which stimulates other structures and this, in some rams, elicits reactions as if of pain. The number of stimulations should be minimal. Semen is usually obtained with three or four stimulations of about four seconds each by a trained operator. Under field conditions it is tempting to prolong stimulations but, if no ejaculation has been produced following five or six stimulations, that attempt should be curtailed. It should be remembered that the volume of semen obtained can be small and that even experienced operators fail to produce any ejaculate in up to 10 per cent of cases after an initial series of stimulations.
- 2) Where it is considered that more stimulation than above may have to be administered, consideration should be given to the use of analgesic. The situation could, for instance, apply to vasectomised rams and perhaps those animals on which a second attempt was to be made on the same day for any reason.
- 3) If there is any evidence of undue stress or pain from either the handling or the stimulation, the procedure should be abandoned or an analgesic or even a general anaesthetic administered.
- 4) It is counter-productive in most instances to subject ram lambs to electrical ejaculation under the age of six months.
- 5) Rams may be stimulated in the standing or the lying position depending on the preference of the operator.

Analgesia and anaesthesia

- 1) A previous report from a working party of the Society for the Study of Animal Breeding recommended that electroejaculation should generally be performed while a ram was under the influence of a tranquilliser. However, it is now recognised that although tranquillisers will cause relaxation, for the most part they do not have significant analgesic properties. The desired effect should be that of an analgesic or general anaesthetic agent at a low dose rate.

- 2) No appropriate preparation is available, licensed for use in sheep. This leads to a reluctance to use a tranquilliser or an anaesthetic widely under farm conditions, particularly when a large group is to be examined. The management of the treated rams in the 24 hour period after examination also poses problems as they should not be mixed with untreated rams during this time and it is desirable to keep animals which have been treated with such drugs under close observation. Any rams with an undetectable chronic respiratory or circulatory condition would be especially at risk. Decisions must be taken in the interest of the animal's welfare weighing all the factors and this embraces the use of drugs.
- 3) It should be the aim to reduce discomfort to the minimum possible and, on balance, trained operators will achieve this in the majority of cases by obtaining collections within a total stimulation time of 12 – 16 seconds over a period of 20 – 28 seconds. The average ram might be subjected to this only two or three times in its lifespan. It is therefore questionable whether the administration of an effective analgesic or anaesthetic is justified in routine cases, taking the relative risks involved into account, when the procedure is performed at this frequency. However, veterinary clinicians are best placed to judge each situation on its merits, to select preparations with analgesic properties as indicated, and advise on their use accordingly. Xylazine has been used but it is not recommended, partly because it does not have a licence for use in sheep.

Conclusions

- 1) It is concluded that collection of semen is not a necessary part of the routine examination for breeding for rams in which normal fertility has been proven. At the annual re-examination they may be found to be satisfactory on clinical grounds alone or, alternatively lesions may be palpable which would enable a diagnosis to be made without recourse to semen assessment.
- 2) It is recommended that the decision whether or not to collect semen should rest with the veterinary surgeon in attendance and it should be his/her responsibility to decide how this will be done, taking all relevant factors into account. This will include consideration of the advantages and disadvantages of using a sedative or anaesthetic agent when an electroejaculation technique is employed. With good management and technique, the magnitude of stress and pain can be reduced so that analgesia or anaesthesia is required only in a minimum number of cases.
- 3) Anyone wishing to use this procedure should obtain advice from suitably experienced members of the Sheep Veterinary Society.

