



SOP 4.06 Reproductive ultrasonography in the female bovid

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Purpose

- (1) The objective of this standard operating procedure is to provide guidance to the Charles Sturt University staff on:
 - a. Visualising the structures of the reproductive tract and its contents and to describe the state of the ovaries, the pregnancy status, number of fetuses, the stage of gestation (by embryo/fetal size), viability of the conceptus and any other embryonic or fetal features such as fetal sexing.

Scope

- (2) This procedure applies to any person who is involved in AEC approved projects involving transrectal ultrasonography of the reproductive tract in a female bovid.
- (3) All researchers and teaching staff using animals for scientific purposes must be competent. For definition of competency refer to Charles Sturt University's Policy on 'Animal Care Competency Training and Assessment'

Details of procedure

- (4) Animals are examined while confined in a crush, with or without head bail restraint and/or a rear restraint gate/bar (depending on temperament). A well lubricated gloved hand and transducer/probe is carefully introduced into the rectum. The operator needs to be aware of techniques to deal with straining and peristalsis of the rectum by the animal. Care must be taken to avoid perforation of the rectum by the hand or the probe.
- (5) The reproductive tract is located, and the probe is moved over the extent of the uterine horns and body to determine pregnancy status, stage of gestation and number of fetuses present. The operator examines the uterine fluid, the embryo/fetus for viability and size and any other features of the tract or conceptus that may be relevant. The ovaries can be located and examined for presence and size of follicles, corpora lutea and other structures such as cystic or luteinised follicles. Suitability of animals for examination depends on their size and the size of the operator's hands. In general, animals of 250-300kg live weight or greater, pose no problems, but smaller animals may be examined with appropriate precautions.

Drugs, chemicals, or biological agents

- (6) None are generally applicable.

Impact of procedure on wellbeing of animals

- (7) With competent operators, this procedure has minimal impact on the animals. No adverse effects on the cow or her conceptus particular to ultrasonographic examination have been



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found and the movement of the probe over the tract and ovaries is less of a disturbance than with palpation techniques. Occasionally this procedure may result in severe straining, ballooning, and bleeding of the rectum. Examinations should not continue if substantial bleeding is detected or severe discomfort is perceived.

Animal care

- (8) Generally, no special care is necessary, but awareness of the animal's reactions to the procedure should be observed and undue stress prevented.

Pain relief

- (9) None usually required.

Reuse and repeated use

- (10) Cows should not be used for more than two consecutive days if examined for more than a total of 2 hours in any one day. Daily examinations (or several times within a day) will cause no problems if examinations are of short duration (up to five minutes), provided other restrictions and cautions are observed.
- (11) Cows may be used in one session per day and may be used on a second day after an overnight rest. They may be used for a maximum on 2 days in any one fourteen-day period. Reuse should only occur after assessment of the cow by a veterinarian or a qualified instructor.
- (12) Cows not showing rectal thickening may be used once weekly or two days every fortnight, unless removed for some other reason. Cows which show evidence of thickening of the rectal wall should be withdrawn immediately and not used for a period of one month, after which reuse should only occur after assessment of the cow by the veterinarian or a qualified instructor.
- (13) If not used two days in a row, they can be used once weekly. Cows not showing rectal thickening may be used once weekly, or for two days at fortnightly intervals unless removed for some other reason. The greatest risk to the cows is from mucosal abrasion of the rectum due to the number of 'arms' entering the rectum and examining the pelvic contents. In view of the rapid regeneration of rectal mucosa (Holyhead et al, 1983) this time should allow for sufficient mucosal regeneration and healing to occur if necessary. Cows which show evidence of thickening of the rectal wall should be withdrawn immediately and not used for a period of one month, after which reuse should only occur after assessment of the cow by a veterinarian or qualified instructor.

Qualifications, experience or training necessary to perform this procedure

- (14) Demonstrator - experience with the procedure. Thorough knowledge of the physiology and anatomy involved. Demonstrators should have a sound knowledge of reproductive physiology, embryonic and fetal development, ovarian dynamics and the relevant endocrinology. Knowledge of the physics of ultrasonography and associated equipment is also necessary. Some procedures may be subject to restrictions by legislation.



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- (15) Students - students may be learning the techniques as part of certificate or degree courses, as technical assistants or may be livestock producers or service agents to the industry. Prior experience with handling livestock and a background knowledge in reproduction is desirable. The extent of knowledge of reproductive physiology required, will vary with the intended use of techniques by the student (e.g., research versus diagnoses for management decisions).

Record requirements

- (16) Appropriate monitoring and recording of the use of animals must occur.

Associated documentation (including pictures if available)

- (17) None

Glossary

- (18) None

References and relevant links

- (19) Pierson, R.A. and Ginther, O.J. (1988), *Theriogenology*. 29: 3-20
(20) Pierson, R.A. et al., (1988), *Theriogenology*. 29: 21-37
(21) Kastelic J.P. et al., (1988), *Theriogenology*. 29: 39-54.
(22) Colloton, J. (2021). *Reproductive ultrasound of female cattle*. Hopper, R. M. (Ed.). *Bovine Reproduction*, 2nd edition. John Wiley & Sons.
(23) https://www.dpi.nsw.gov.au/animals-and-livestock/animal-welfare_old/general