RUM_012 Oestrus synchronisation in cows and heifers

I. OBJECTIVE

To achieve synchronised oestrus and ovulation in a majority (large proportion) of females in a flock (cows / heifers).

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." (as per, Australian code for the care and use of animals for scientific purposes, 2013)

III. COMMENTS / RECOMMENDATIONS

- As routine, any health concerns should be managed as per veterinary advice.
- 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, and any variation to this SOP.
- **Reuse and repeated use -** Within a breeding season, animals can be treated a second (or more) time to re-synchronise those not conceiving to mating at the previous synchronised oestrus. Animals can be treated in successive years with no adverse effects.
- **Care of animal(s) during/after procedure -** No special care is generally necessary, and animals fitted with devices rarely have any problems. Infections are rare when adequate attention is given to hygiene, but should be attended to, with veterinary advice if necessary.
- **Pain relief measures -** Not necessary.
- **Qualifications, experience or training necessary to perform this procedure -** Competence in handling cattle followed by adequate demonstration and instruction with the necessary observation of veterinary restrictions on S4 drugs, when applicable.
- **Demonstrator** - experience with procedures. Adequate knowledge of the physiology and anatomy involved. Demonstrators may require a thorough and extensive knowledge of reproductive physiology and endocrinology, depending on the students being taught (i.e. competency).
- **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.
- **Drugs, chemicals, or biological agents** These are mentioned below and include various formulations (and analogues) of progesterone, prostaglandin (PG), oestradiol, pregnant mare serum gonadotrophin (eCG/PMSG), and could also involve follicle stimulating hormone (FSH), luteinising hormone and gonadotrophin releasing hormone (GnRH or analogues). Some may involve S4 restrictions.
- **Impact of procedure(s) on the wellbeing of animal(s)** - The procedures synchronise the naturally occurring event of oestrus. However, the concentrated incidence of mounting activity warrants extra care during yard operations. No adverse effects are usually associated with the devices or injections, provided adequate hygiene is observed.

IV. EQUIPMENT

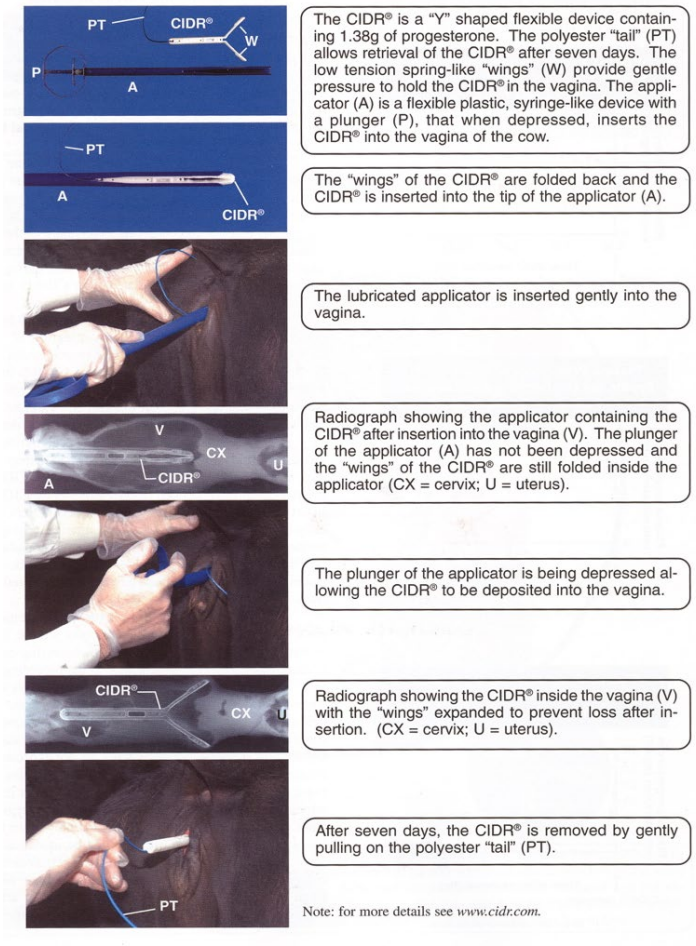
- CIDR, CueMate or PRID applicator
- Obstetrical lubricant.
- Antiseptics and paper towel as necessary.

V. PROCEDURE

The procedure involves administering hormones by intramuscular injections and intravaginal devices; combinations of the injections and intravaginal devices are commonly used.

The procedures act by imposing an artificial or supplemental progesterone regimen that can be manipulated by the operator to shorten or lengthen the animals' own progesterone dominant/dioestrous phase. Additional hormones can be given at the start, during, or at the end of the progesterone phase to control follicular development and/or promote expression of oestrus. Several procedures are available as commercial products, some involving S4 classified drugs.

1. **Injections** - synchrony using injections only is achieved by giving prostaglandin (PG), which causes deactivation and regression of functional corpora lutea (CL). A single injection will result in synchrony in varying proportions (half to three-quarters) of the animals in the herd i.e. only those having CL at a responsive stage at the time of injection. Two injections, given 10-12 days apart, will produce synchrony in 95-100% of cyclic cows, by ensuring responsive CL in all/most cows at the time of second injection. PG is also often given near or at the end of the progesterone phase provided by intravaginal or implant techniques. Injection of gonadotrophins, commonly equine chorionic gonadotrophin (eCG) or pregnant mare serum gonadotrophin (PMSG), or gonadotrophin releasing hormone or analogues (GnRH), will stimulate follicle development and/or ovulation to promote expression of oestrus and ovulation.
2. **Intravaginal devices** - these are known as controlled internal drug release (CIDR), progesterone releasing intra-vaginal devices(PRID®) or Cue Mate® devices. They are impregnated with progesterone and/or progestagens which is absorbed through the vaginal mucosa while the device remains in place, usually 5-12, but up to 21 days. The device is fitted using an applicator, according to instructions supplied. The end of the device should be lubricated and inserted carefully into the vagina, which has been previously cleaned by wiping the outside with disposable paper towel or similar. Cows are best restrained in a crush, but an arrow race to restrict movement is acceptable if temperament allows. Devices are removed by carefully pulling on the draw string. If the string is missing or inaccessible, the device can be expelled by using a gloved hand per rectum or per vaginum.



The CIDR® is a "Y" shaped flexible device containing 1.38g of progesterone. The polyester "tail" (PT) allows retrieval of the CIDR® after seven days. The low tension spring-like "wings" (W) provide gentle pressure to hold the CIDR® in the vagina. The applicator (A) is a flexible plastic, syringe-like device with a plunger (P), that when depressed, inserts the CIDR® into the vagina of the cow.

The "wings" of the CIDR® are folded back and the CIDR® is inserted into the tip of the applicator (A).

The lubricated applicator is inserted gently into the vagina.

Radiograph showing the applicator containing the CIDR® after insertion into the vagina (V). The plunger of the applicator (A) has not been depressed and the "wings" of the CIDR® are still folded inside the applicator (CX = cervix; U = uterus).

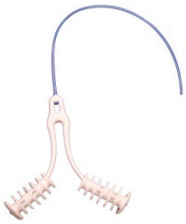
The plunger of the applicator is being depressed allowing the CIDR® to be deposited into the vagina.

Radiograph showing the CIDR® inside the vagina (V) with the "wings" expanded to prevent loss after insertion. (CX = cervix; U = uterus).

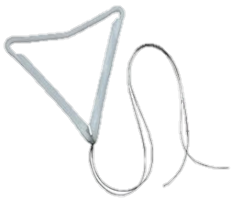
After seven days, the CIDR® is removed by gently pulling on the polyester "tail" (PT).

Note: for more details see *www.cidr.com.*

CIDR insertion



Cue-Mate device



PRID device

General reference: Wright PJ & Malmo J (1992) Veterinary Clinics of North America: Food Animal Practice. 8: 57-89.

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

Conditions:

- Investigators named in an animal ethics application, relative to this SOP, must be competent to implement the SOP
- Any variation to this SOP must be described in the relevant animal ethics application
- If this SOP has not been reviewed and approved by a UQ AEC within the last three years it is no longer valid and cannot be used in animal ethics applications until reapproved (see "AEC Reviewed/Approved" date in this document's header).