

## HEAT DETECTION AND BREEDING

### 1. PURPOSE

Heat detection is a key factor in determining the reproductive success of the dairy herd. The purpose of this SOP is to identify the different signs shown by cows in estrus (heat) and the best time to do heat detection in order to determine the proper timing of artificial insemination (AI).

### 2. RESPONSIBILITY

- 2.1 Trained and qualified personnel
- 2.2 Herd Veterinarian
- 2.3 Herd Manager
- 2.4 CIAQ technician

### 3. GENERAL

- 3.1 Ovulation usually occurs approximately 24 to 32 hours after the onset of standing estrus in dairy cows.
- 3.2 Optimal fertility of ova is projected to be between 12-18 hours after ovulation.
- 3.3 The viable life span of sperm in the reproductive tract is estimated at 18-24 hours. (Fig.1)

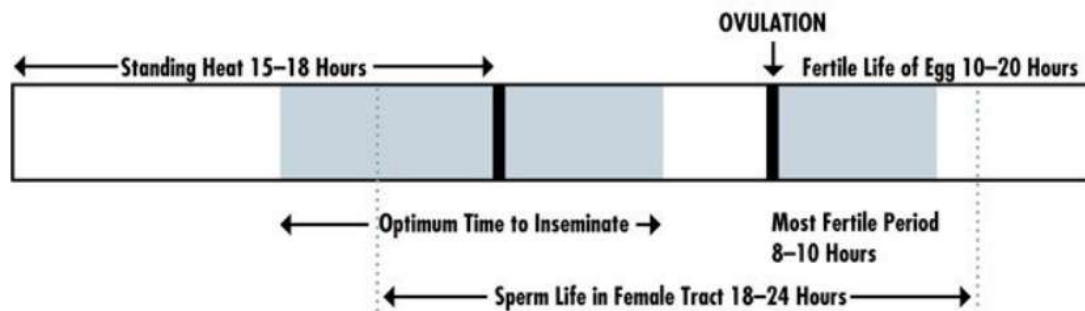


Figure 1: Events and time intervals associated with standing heat and insemination

- 3.4 The primary sign of estrus is a cow standing to be mounted by another cow(s). There are secondary signs of estrus such as mucus discharge, alertness, and bellowing that can also be attributed to other causes, therefore it is necessary to have more than one secondary sign to confirm that the cow/heifer is really in estrus. Refer to Appendices

- [DC-A-4A: Heat Cycle, Signs and Conception Rate of Dairy Cattle](#)
- [DC-A-4B: Signs of Heat in Dairy Cattle](#)
- [DC-A-4C: Factors influencing Heat Detection in dairy Cattle](#)



- 3.5 A good record keeping system must be maintained. All heats must be recorded even if the cow is not bred at that heat.

- 3.6 Best time for AI: (Refer to Table 2)
- 3.6.1 Inseminations should be performed as much as possible during the heat period since secretions (mucus) from the cervix and the uterus have very powerful bactericidal properties. Furthermore, these secretions increase the strength and lifespan of the sperm.
  - 3.6.2 Once the heat is over secretions decrease rapidly.
  - 3.6.3 If semen is deposited within 6 hours after the beginning of the standing heat, the spermatozoa will be dead at the time of ovulation since frozen semen has a 20-24-hour life span.
  - 3.6.4 The best time for insemination starts 10-15 hours after the beginning of the standing heat. Refer to Appendix [DC-A-4A: Heat Cycle, Signs and Conception Rate of Dairy Cattle](#).
  - 3.6.5 Heat is usually detected when the animal is in proestrus.
- 3.7 Cow gestation is 9 months.

## 4. PROCEDURE

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- 4.1 Semen is preselected from a list provided by CIAQ and is cryopreserved in a nitrogen tank located in the Dairy Barn Pharmacy or is supplied upon request by the technician on the day of the breeding.
- 4.2 Refer to the whiteboard in the Dairy office, and *Résumé de visit* in the blue binder for Heifers and Cows that:
- 4.2.1 May be in or are approaching estrus according to their cycle. In these cases, go to 4.3
  - 4.2.2 Will be bred on a Breeding Protocol, as per the card posted on the whiteboard.
- Note: The whiteboard is updated regularly by the Dairy Herd Manager or Lead Technician.
- 4.3 HEAT DETECTION:
- 4.3.1 Cows must be observed for heat detection at least 3 times daily at each time husbandry, feeding, or milking activity is performed in the barn. Refer to Appendix [DC-A-4B: Signs of Heat in Dairy Cattle](#).
  - 4.3.2 Observe for signs of primary and secondary signs proestrus. (Table 1)
  - 4.3.3 Record any estrus-related or proestrus observation in the Logbook (Tables 1 & 2).
  - 4.3.4 If estrus is detected, immediately inform the Dairy Herd Manager or Lead Technician.
  - 4.3.5 The Dairy Herd Manager or Lead Technician will:
    - 4.3.5.1 Confirm the estrus.
    - 4.3.5.2 Determine the following, according to the animal's profile. (e.g., age, body condition, days in milk and estrus cycle accuracy, etc.)
      - 4.3.5.2.1 Breed via AI.
      - 4.3.5.2.2 Not breed at all.
      - 4.3.5.2.3 Used as an embryo recipient (performed by a veterinarian).

- 4.3.5.3 If appropriate, will select the bull for artificial insemination.
- 4.3.5.4 Refer to the Semen Inventory card in the Breeding Binder to ensure the selected semen is available.

#### 4.4 DECISION TO BREED

- 4.4.1 Extract the animal's registration record.
    - 4.4.1.1 Attach a Post-it label identifying the bull's name.
    - 4.4.1.2 Attach a Post-it, identifying the animal's location in the barn (e.g., second pen/left side, first row/right side).
  - 4.4.2 Call the Centre d'Insemination Artificielle du Québec (CIAQ) to request for breeding via AI. Note: The request for AI service deadline is 8:30 am.
  - 4.4.3 The CIAQ technician provides a receipt of the AI service and places it with the cow/ heifer's registration paper in the sheet protector.
  - 4.4.4 Transfer the following information from the receipt to the SAILLIES section of the logbook.
    - 4.4.4.1 Bull name and registration number.
    - 4.4.4.2 Date of service.
    - 4.4.4.3 Cow or Heifer's name and identification number.
  - 4.4.5 Return the registration paper back to the respective binder.
  - 4.4.6 If the animal does not show signs of estrus or post estrus within 18-24 days, there is a good possibility the animal is pregnant.
  - 4.4.7 The veterinarian will confirm pregnancy during his bi-weekly herd health visits and will record the observations in the "DSA Laitier" Software.
- 4.5 IF NOT PREGNANT: The following options or course of action will be determined by the herd veterinarian if the animal is not pregnant:
- 4.5.1 Breed again at the next natural estrus (as above).
  - 4.5.2 Implement hormone treatment according to the recommendations of the veterinarian.

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## 5. REFERENCES

- 5.1 Select Reproductive Solutions. Heat Detection and Timing of Artificial Insemination. Retrieved from [http://www.selectsires.com/resources/fertilitydocs/heat\\_detection\\_timing.pdf?ver\\_](http://www.selectsires.com/resources/fertilitydocs/heat_detection_timing.pdf?ver_)
- 5.2 Pennsylvania State University. PennState Extension. Heat Detection and Timing of Insemination for Cattle. May 17, 2016. Retrieved from <https://extension.psu.edu/heat-detection-and-timing-of-insemination-for-cattle>.

## Document Status and Revision History

DATE	STATUS
11-June-2019	Version 01: MAC Campus FACC approved
21-Jul-2023	Version 02: MAC Campus FACC approved