



SAGWADI

ANIMAL HUSBANDRY & GENETIC IMPROVEMENT

Advanced Artificial Insemination Manual

Precision Protocols for Zebu (Bos indicus) Breeding

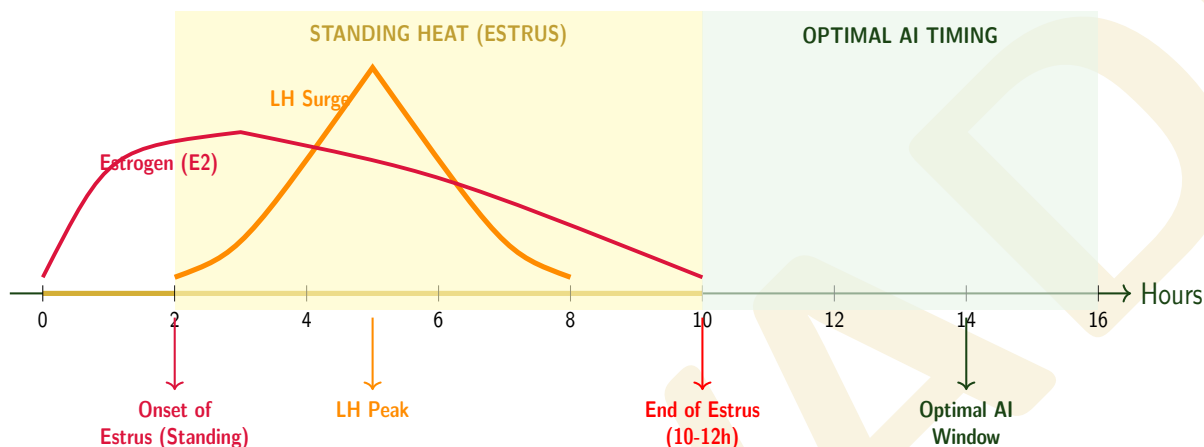




1 Zebu Physiology & Estrus Detection

At Sagwadi, achieving exceptional conception rates requires acknowledging the unique reproductive physiology of Zebu cattle. Unlike European breeds, Zebu often exhibit highly subtle ("silent") heats, and their estrus window is significantly shorter (averaging 10 to 12 hours).

Fig 1: Zebu Estrus Timeline & Heat Detection



Stress & Cortisol Warning

Thermal stress ($> 28^{\circ}\text{C}$ /THI > 72) or handling stress causes Cortisol spikes, which severely suppresses LH pulsatility and sperm transport. Early morning, silent handling is strictly required.

Optimal Insemination Timing (The AM/PM Rule)

- **Detection:** Visual observation is the gold standard. Check for standing heat in the cool hours of early morning and late evening (at least 30 minutes of undisturbed observation per session).
- **Protocol:** If observed in standing heat in the **AM**, perform AI that same **PM**. If observed in standing heat in the **PM**, perform AI the following **AM**.



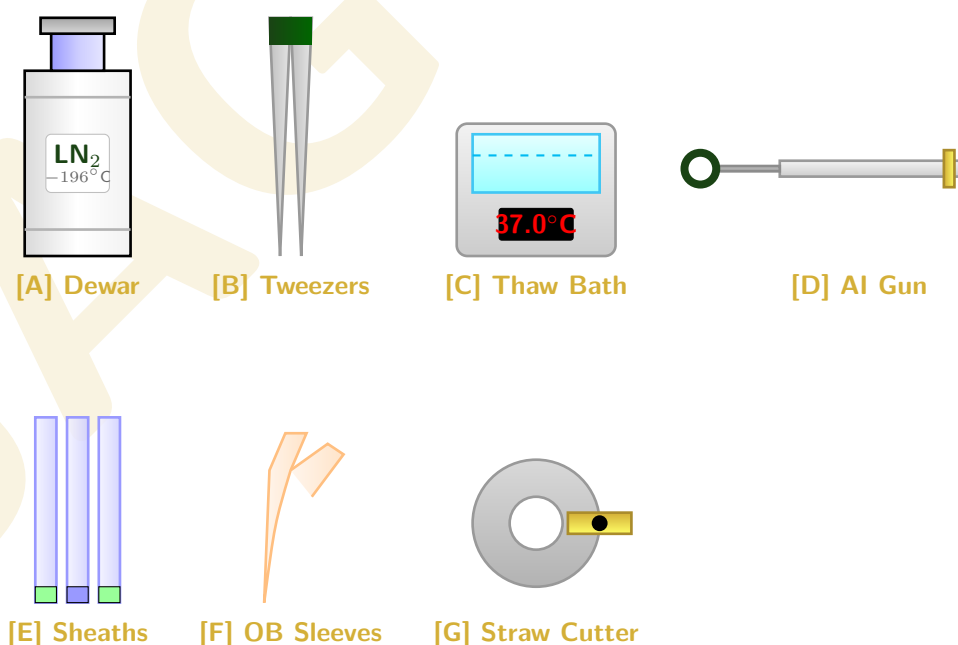


2 Materials & Equipment Inventory

Precision inside the cow begins with precision outside the cow. The following equipment must be immaculately clean, calibrated, and staged before the cow enters the chute.

Ref	Category	Item	Sagwadi Specifications & Use
[A]	Storage	Liquid Nitrogen Dewar	Stores semen indefinitely at -196°C . Monitor levels weekly to prevent catastrophic thawing.
[B]	Handling	Tweezers	Long, specialized forceps to quickly extract straws from the goblet without raising adjacent straws.
[C]	Thermal	Electronic Thaw Bath	Must be strictly calibrated to 37.0°C (98.6°F). Water must be fresh and clean.
[D]	Apparatus	AI Gun	Stainless steel insemination syringe (0.25cc or 0.5cc compatible). Plunger must move smoothly.
[E]	Consumables	Sheaths & Chemises	Disposable plastic split-sheaths to lock the straw, and sterile over-chemises (Sanitary Sleeves).
[F]	Consumables	OB Sleeves & Lube	Shoulder-length palpation sleeves. Use non-spermicidal obstetrical lubricant exclusively.
[G]	Prep	Straw Cutter	Clean, sharp cutter designed specifically for French straws to ensure a perfect 90-degree cut.

Fig 2: Realistic Equipment Visual Reference Guide





3 Semen Thawing & Gun Assembly

The thawing process is the most critical external step. Rapid temperature shifts or prolonged exposure to sunlight/ambient air will instantly kill the fragile thawed sperm cells.

Strict Cold Chain & Thaw Protocol

Time limit: The straw must be moved from the liquid nitrogen to the thaw bath in less than **5 seconds**. Do not lift the canister above the frost line in the neck of the dewar.

- 1. Thaw the Straw:** Using tweezers, extract the desired straw and plunge it directly into the 37°C water bath. Leave it submerged for exactly **45 seconds**.
- 2. Dry the Straw:** Remove the straw and immediately dry it with a clean paper towel. *Water is highly spermicidal; the straw must be bone dry.*
- 3. Load the Gun:** Pull the plunger of the AI gun back 4 to 5 inches. Insert the cotton-plug end of the straw into the chamber of the gun.
- 4. Clip & Sheath:** Cut exactly 1/4 inch off the sealed tip of the straw at a perfect 90-degree angle. Slide the protective plastic sheath over the gun barrel and secure it firmly with the O-ring. Keep the loaded gun warm until insertion.

Fig 3: Proper AI Gun Assembly & Straw Insertion





4 The Rectocervical Insemination Procedure

At Sagwadi, we utilize the standard rectocervical technique. Because Zebu cattle often possess a more tortuous and muscular cervix than European breeds, gentle, patient manipulation is required to thread the gun without causing trauma.

Step-by-Step Chute Procedure

- **Sanitation:** Wearing an OB sleeve, evacuate feces from the rectum. Wipe the cow's vulva completely clean with a dry paper towel. Spread the vulva lips to ensure the gun enters without contacting the outer skin.
- **Insertion:** Insert the AI gun at a 30 to 45-degree upward angle to bypass the urethral opening, then level it out as it passes through the vagina toward the cervix.
- **Cervical Grasp:** Using your palpating hand inside the rectum, sweep down to locate the cervix (it feels like a firm, gristly turkey neck). Grasp it gently but firmly.
- **Threading the Rings:** *Do not push the gun through the cow.* Instead, hold the gun steady with slight forward pressure, and use your rectal hand to manipulate the cervix around and over the tip of the gun. Thread it through the 3 to 4 distinct cervical rings.

5 Target Deposition Site

The ultimate goal of the insemination process is to deliver the highest concentration of viable sperm exactly where they have the best physiological advantage.

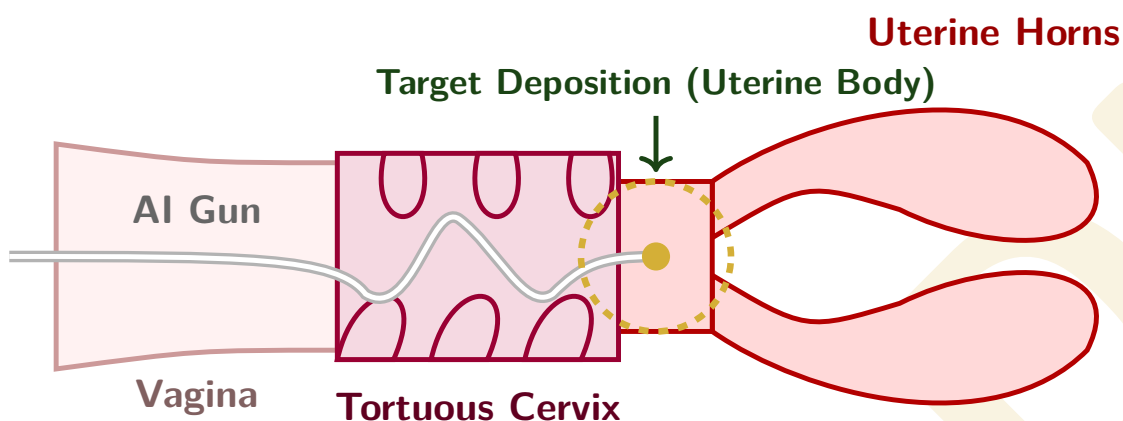
Crucial Anatomy Check

If the gun goes too deep into one of the uterine horns, you risk depositing all the semen on the non-ovulating side, resulting in immediate failure. The target is the **Uterine Body**.

Once the tip of the gun passes the final annular ring of the cervix, you will feel the dense cartilage give way to a soft, spongy tissue. This is the uterine body.

1. **Verify Placement:** The tip of the gun should be exactly **1/4 to 1/2 inch** past the internal opening of the cervix. You should be easily able to feel the tip resting just outside the cervical rings.
2. **Deposit:** Slowly and smoothly press the plunger over 3 to 5 seconds. Pushing too fast damages the sperm.
3. **Withdrawal:** Slowly retract the gun and your arm. Inspect the sheath for any signs of blood or infection.

Fig 4: Anatomical Target for Semen Deposition



Technical Support & Consultations

For any questions, troubleshooting, or advanced technical assistance regarding these protocols, please reach out to our team at:

contact@sagwadi.com