Semen collection

Semen collection is a complex procedure involving coordinated efforts between the animal handler and the collector. Effective harvest of semen involves obtaining the maximum number of sperms of the highest possible quality in each ejaculate.

The ultimate objective is to make maximum use of superior sire, which involves:
1. Proper semen collection procedures used for males.
2. Sexual stimulating to the sire.
3. Proper semen processing techniques.

Age When Semen Can Be Collected:

<table>
<thead>
<tr>
<th>Species</th>
<th>Age (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bull</td>
<td>12</td>
</tr>
<tr>
<td>Boar</td>
<td>6 - 8</td>
</tr>
<tr>
<td>Ram</td>
<td>6 - 9</td>
</tr>
<tr>
<td>Stallion</td>
<td>20 - 24</td>
</tr>
<tr>
<td>Dog</td>
<td>8 - 12</td>
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</tbody>
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Facilities needed for semen collection

There are several essential features that must be considered in designing facilities for collecting semen:

1. Safety of the handler and the collector.
2. The collection area must provide good footing to prevent slipping and injury to the male being collected.
3. Restrain the teaser animals.
4. Easy access for semen collection.
Methods of Semen collection

1. Collecting the semen from the vagina of the naturally mated female with a spoon, syringe or long pipette.
2. Breeding bag (Condom):
3. The massage method.
5. Surgical method.
6. The artificial vagina (A.V.) method.

1- Collection of semen from the vagina after naturally mated female with spoon, syringe or long pipette.

Disadvantages:
- Small volume of semen is obtained mixed with a large volume of vaginal mucous.
- Transmission the venereal disease may occur.
- Injury may occur.
- This method requires a cow in estrous.

2- Breeding bag (Condom):
Is a strong rubber bag used for semen collection in stallions, in which applied over the erect penis leaving a loose distance over the glans and the air should be squeezed out just prior to service. It held in place by rubber bands and removed immediately after service.

3- The massage method:
- involves massage the vesicular glands and ampulla by way of the rectum.
- It requires two people, one to do massage and one to collect the semen and mainly applied for semen collection from bulls.
- After removal of feces from the rectum, a longitudinal back and forth massage is applied, when the urethralis muscle begins to pulsate, the massaging action should be in synchrony with the pulsations.

Advantages:
- No expensive equipment is required.
- The technique avoids the potentially painful aspects of electroejaculation.

Disadvantages:
- A skilled experience is required.
- Libido, mating ability, penile erectile function and the ability to ejaculate are not evaluating.
- Because of erection not occurs, semen samples may be contaminated with epithelial cells, bacteria, and dirt especially when it dribbles through the prepuce.
• Urination may occur during the massage.
• Semen volume and concentration are less than the true ejaculate because it represents the residue of previous ejaculate accumulating in the ampulla.
• Present the urine residue, because absent the bulbourethral gland's secretions.
• Rectum injury may occur.

4- Electro-ejaculator:
Used with impaired bulls that are unable to mount, for bulls that are not accustomed to being handled, low sexual activity and aged male. Electro-ejaculator designed to stimulate the pelvic sympathetic and parasympathetic nerves.

**Equipment:**
1-Bipolar electrode and a variable source of alternating current.

- The voltage range 0-30 V
- Amperage: 0.5-1 A.
The technique:

- The rectum emptied from feces, longitudinal massage is applied over the ampulla and urethralis muscle for 1-2 minutes.
- Lubricated probe introduced into the rectum with the electrodes facing ventrally.
- Electrical stimulation should be beginning slowly until the bull shows a minimal response, then gradual increase in the intensity, the stimuli should last 1-2 seconds and then discontinued for 0.5-1 second.
- After several stimulations, clear pre-seminal fluid begins to flow from the protruded penis.
- As soon as the cloudy sperm rich fraction begins to flow the penis, a collection cone with the test tube placed over the penis and sample is collected.
- Rectal probe removed.

Advantages:

- Can be used with a wide range of bulls and rams
- Can be used on untrained bulls and rams
- Usually good collection volumes
- Can be used on bulls unable to mount
- Can be used for initial inspection of bull’s penis and sheath, to check for any growths or extension problems
- Can be used on bulls with decreased libido
- Electroejaculation is the only technique useful for collecting semen from wild animals, in which case the male is anaesthetized prior to the procedure.

Disadvantages:

- Increasing the voltage too rapidly can result in ejaculation without an erection, so the semen will be contaminated with preputial dirt.
- The nerves of hind limbs also stimulated by electrical current, this result in stiffing of the legs and the animal may go down.
- Collected semen quality is large in volume but low in concentration, sometimes contaminated with urine.
- This method is inhuman because it causes severe pain to the animal.
- Electrical stroking of the animal may occur as well as the operator.

5- Surgical method:

A small incision made in the perinea region to locate the urethra, and then a cannula inserted into the urethra. This method is impractical because it leads to adhesion and constriction of the urethra as well as infection of the urogenital system may results.
6- The Artificial Vagina:
• The artificial vagina (A.V.) method of collecting semen is the fastest and more sanitary of the various methods available.
• An artificial vagina is used to collect semen from many species, most prominently cattle and horses, but also sheep, goats, rabbits and even cats.
• An A.V. provides a good imitation of the natural vagina, which uses thermal and mechanical stimulation to stimulate ejaculation.
• Components of A.V.
  1. A strong outer casting (cylinder)
  2. Thin inner rubber (sleeves).
  3. Rubber bands.
  4. Valve.
  5. Receiving cone.
  6. Test tube.
  7. Warming bag.
Requirements of A.V.:
- Pressure: By filling water and a little air into the space between the casing and inner liner.
- Temperature: By warm water of 45 C at collection (temperature of water at filling: 55 to 60 C).
- Lubrication: Around the front area of the liner with sterile and harmless lubricating jelly.

Advantages:
- Practically the whole ejaculate is collected in the uncontaminated and natural stage.
- It is free from the extraneous secretions.
- A sterile condition of the apparatus ensures disease control.
- The viability of the sperm is better.
- No female is needed if a dummy is available.

Disadvantages:
- Takes a lot of time, especially in breeds with decreased libido.
- Bulls need to be trained.
- Increase in labour.
- Cannot be used with structurally unsound bulls.
- Hazardous to the collector.

PRECAUTIONS MUST BE TAKEN AT THE TIME OF COLLECTION TO ENSURE HIGH-QUALITY SEMEN:
- Cold shock is prevented by providing adequate protection for the collection funnel and tube.
- The collection tube must be protected from sunlight.
- Contamination of semen by urine, water, or lubricant jelly must be avoided.
- Microbial contamination is minimized by using a different sterile artificial vagina for each ejaculation.

Methods of Sexual stimulation prior to collection with the artificial vagina.
- By exposing bulls to a teaser for several mins.
- False mounting (2 to 3 times)

Reasons for sexual stimulation:
- To ensure that bull will mount and ejaculate normally.
- To ensure the collection of the maximum number of sperms with the highest possible quality per ejaculate.