**Artifical insemination**

**Artifical insemination** involves placement of semen in females by mechanical means rather than by natural mating.it is the most impotant single technique devised for the genetic improvement of animals , because afew select males produce enough sperm to inseminate thousands of females per years.

**Important factors for success are** :

a.Knowledge of the care and handling of semen

b.Knowledge of anatomy and physiology of the female

c.Knowledge of care of equipment and sanitation

d.Adequate training and experience by the technician

**Proper timing of artificial insemination is a basic factors for good fertility**

a.Early, accurate detection of heat is essential

b.Correct placement of semen in the uterine cervix

**Depositing the Semen**

1.In natural mating semen is normally deposited in the anterior portion of the vagina.

2.In artificial insemination , the semen is deposited in the uterine cervix . This is necessary because the semen you are using is any where from 10 times and to 20 times more dilute than a normal ejaculate and probably about half of the sperm were killed during the freezing and thawing procedures.

**Advantages and Disadvantage of AI**

**Advantage**

1.Genetic improvement

2.Greater use of superior germ plasm, even allowing its continued use after a bulls death.

3.Control of venereal and other diseases.

4.improved record keeping on farms where used.

5.More economical than natural service when genetic merit is considered.

6.Safer by the elimination of dangerous bulls on the farm, especially for the dairy breeds.

**Disadvantage**

1.Spend a great deal of time checking females for estrus

2.Trained personnel are required to perform the technique.

**Semen Collection**

The aim of the collection of semen for obtain to effective harvest of semen involves obtaining the maximum number of sperm of highest possible quality in each ejaculate.This involves proper semen collection procedures used on males that are sexually stimulated and prepared.Semen collection is a complex procedure involving corrdinated efforts between the animal handler and the collector.

**Methods of Semen Collection**

**1.Artificial Vagina**

**2.Electro Ejaculation**

**3.Massage of the ampullae**

**4.Vaginal spoon**

**Artificial vagina** :composed of external cylinder made of hard plastic . It has a valve near its end. There is another thin plastic tube opened of tube sides, put inside the outer cylinder.Their ends are fitted to the outside the outer cylider.So there will be aspace between the two cylinders filled with hot water and air through the opening of the valve. At the other end of the outer cylinder there is a funnel like structure made from thin plastic its external end fitted with centerifuge test tube to collect the semen.

The space between the two tube is filled to about half with hot water of 50 c in winter, this makes the internal temperature of the vagina about 40-42 c.Some air must be introduced through the valve to make suitable pressure resembling the natural vagina.

During collection must using a cow in estrus tied in a stsnchion.the artificial vagina mustbe held by right hand declinned by an angle of 45 and when the bull is completely jump to serve the collecter must direct the penis toward the artificial vagina by catching the distal part of the prepuce of the bull by the left hand to introduce the penis to artificial vagina.

**Precaution which should be taken before semen and at the time of collection by artificial insemination :-**

1.Cleaning of abdomen by washing and drying and cut the hair of prepuce

2.Never to catch the penis during collection to direct it toward the artifiacial vagina.

3.Microbial contamination is minimized by Using different sterile the artificial vagina for each ejaculation.

4.The collection test tube must be kept crafully from light and cold or hot by putting in water bath of 35 c

5.Cold shock is prevented by providing adequate protection for the collection funnel and tube

6.Contamination of semen by urine , water , or lubricating jelly must be avoided

**Electro Ejaculation**

It is used in sheep and bulls which are unable to jump ,have low sexual activity due to age , or for other reasons are unable to serve the artificial vagina

**The equipment used for electroejaculation males consists of**

1.bipolar electrode

2.a variable source of alternating current .the voltage ranges from 0-30 with a low amperage (0.5 to 1).

The electrode is placed in the rectum immediately above the accessaroy glands so that the nerves of the reproductive system are stimulated.

**Semen collected by AV is better than collected by EE because** :

1.The motility and concentration of spermatozoa in samples collected by EE are slow comparative with samples collected by AV

2.The volume of semen collected by EE is greatly reduced because of very small amounts of gelatin material.

3.EE generally produces samples with greater volume and PH .but lower concentration of sperm cells and fructose.

4.The semen obtained by EE does not survive the stress of freezing so well as semen collected with AV.

5.The semen obtained by AV are more resistant to cold shock compared with semen collected by EE.

**Ejaculation**

Ejaculation is defined as the ejection of semen from the body . the ejaculate icludes spermatozoa from the vas deferens and epididmis and fluid from accessary glands.

**Table : Characteristics of average ejaculate of semen for different species**

|  |  |  |  |
| --- | --- | --- | --- |
| **Species** | **Ejaculation time** | **Volume(ml)** | **concentration** |
| **Bull** | Less than 1 sec | 6 | 1.2 billion/ml |
| **Ram and Buck** | Less than 1 sec | 1.5 | 2 billion/ml |
| **Boar** | 10-20 minute | 200 | 200 million/ml |
| **Stallion** | 10-15 sec | 75 | 150 million/ml |

**SEMEN AND ITS COMPONENTS**