

Deposition of Semen in the Female Genital Tract

There are differences between species in the site of semen deposition during natural mating. In ruminant and primates, semen is deposited in the vagina whereas, in pigs, dogs, camels and horses, semen deposited is intra-uterine. In most species, it is possible to pass an inseminator catheter through the cervix, thus enabling semen to be deposited in the uterus during AI. Exceptions are sheep and goats, where the tightly folded nature of the cervix does not permit easy passage of an inseminating catheter.

The advantages of deposition of the semen in the uterus are:

- ✓ Spermatozoa have less far to travel to reach the oviduct.
- ✓ Fewer spermatozoa are lost through back-flow.
- ✓ Smaller volume of semen can be used per inseminating dose than used for intra-vaginal deposition, thus permitting an ejaculate to be divided into several AI doses.
- ✓ The cervix, which can act as a barrier to the passage of spermatozoa, is bypassed.

The disadvantages: particularly for the human intra uterine insemination (IUI) is that seminal plasma is also introduced into the uterus, unless specific steps are taken to separate the spermatozoa from seminal plasma before (IUI).

Inseminating routes:

Insemination is a deposition of semen intra female genital tract artificially, this technique needed for following:

- Aseptic and clean place to avoid exposure of female genital tract to contamination.
- Cleaning and disinfectant of external genital organs.

There are two ways for insemination

- I. Non-Surgical route.
- II. Surgical route.

Non-Surgical routes including:

1. By using vagino-speculum or vaginoscopy, with catheter insertion to directly injection of semen in depth of 4 – 6 cm of cervix.
2. Deep cervical insemination or trans-cervical or recto-vaginal insemination: speculum is not needed, but by inseminator hand fixing the cervix through rectum and by other inseminator hand introduces catheter or inseminator-gun via external orifice of cervix deeply then semen deposited.
3. Trans-uterine: the same steps of trans-cervical are applied but with more insertion of catheter reaching to uterine body or even horns bifurcation.

Note: all three routes can performed in cows, but in ovine and caprine the insemination needed for vagino-speculum and semen deposition either intra-vaginal on external orifice of cervix or trans-cervix in a front portion of cervix (intra-cervix; 1st to 2nd annular rings).

Note: conception rate of AI increased with deeper precipitation of semen. i.e. conception rate in intra-uterine higher than intra-cervical or intra-vaginal inseminations.

Surgical routes including:

1. Uterine insemination by laparotomy.
2. Uterine insemination by endoscopy, this is more recent and developed method used to get high conception rate.

Advantages of Surgical methods:

- a. Easily practical and can repeated routinely.
- b. Low sperm concentration required about 5×10^6 sperms/insemination.
- c. Increasing the fecundation rate of frozen semen in comparison with other routes.
- d. Facilitate and support the embryo transfer technique by increasing the conception rate.

Factors affecting successful of AI:

- 1) Site of insemination.
- 2) Time and number of insemination.
- 3) Concentration of sperms in inseminating dose.
- 4) Other factors like; semen characteristics, health and age of female, type of estrus (nature or induced) and early pregnancy diagnosis.