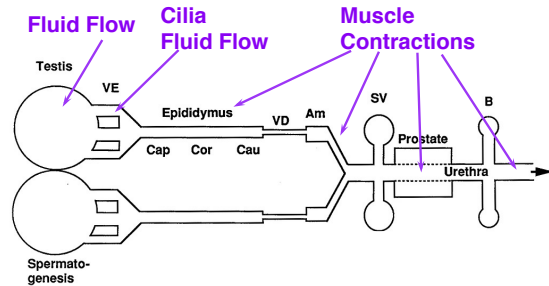


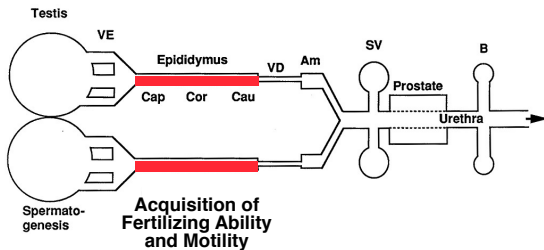
Animal Science 434

Lecture 16: Gamete Transport

Sperm Transport in the Male Tract



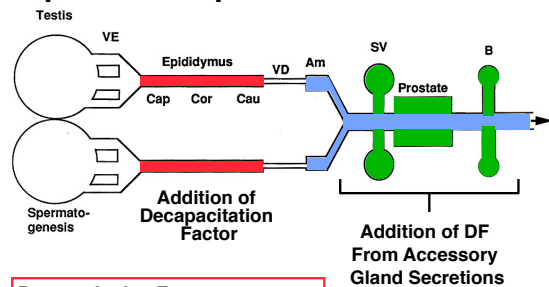
Sperm Transport in the Male Tract



Acquisition of Fertilizing Ability and Motility

- No protein synthetic ability
- addition or loss of plasma membrane proteins and lipids
- redistribution of proteins and lipids within sperm
- changes in lipid diffusion coefficients

Sperm Transport in the Male Tract



Addition of Decapacitation Factor

Addition of DF From Accessory Gland Secretions

- Decapacitation Factor
- protein, glycolipid and/or lipid
- stabilizes the plasma membrane

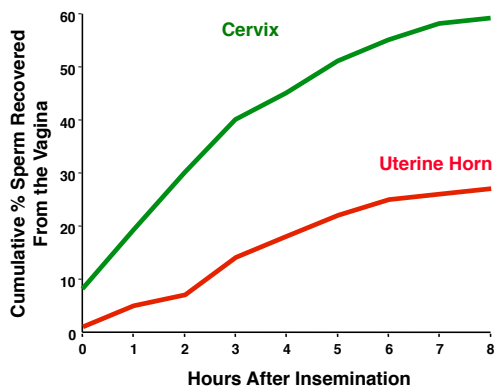
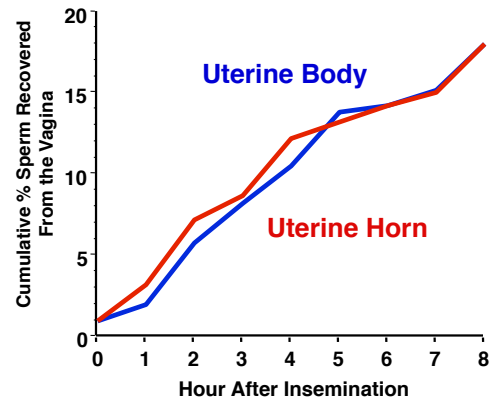
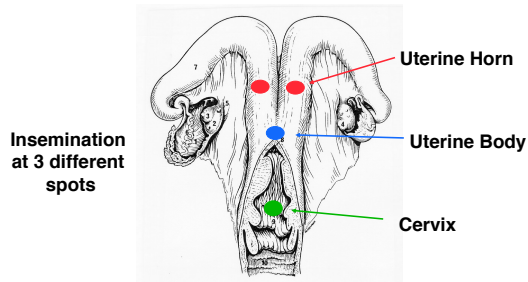
Site of Ejaculation

Site of ejaculation	Semen Characteristics	Species
Vagina	slight coagulation of ejaculate	human, rabbit
vagina	semen with high sperm concentration	cattle, sheep
uterus	voluminous, distention of cervix	horse
cervix, uterus	voluminous, retention of penis during copulation	dog, pig
uterus	vagina plug	rodents

Sperm Loss From Female Tract

- retrograde flow
- phagocytosis by neutrophils

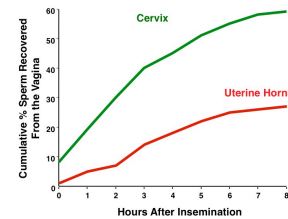
Experiment on Retrograde Flow in the Cow



Assume 10 million inseminated

Uterine Horn at 8 hr
= 25% loss or 75%
retained = 7.5
million sperm
retained

Cervix at 8 hr = 60%
loss or 40% retained
= 4 million sperm
retained



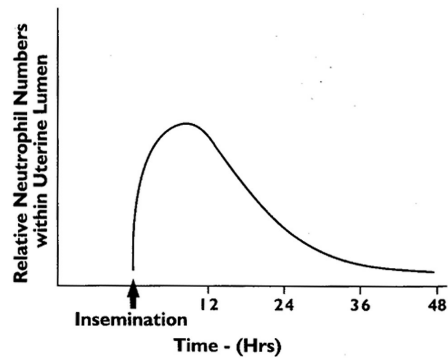
Evolutionary Strategies for Dealing With Retrograde Flow of Semen

- coagulation of semen or a plug
- concentrated semen
- semen deposited in uterus

Sperm Loss From Female Tract

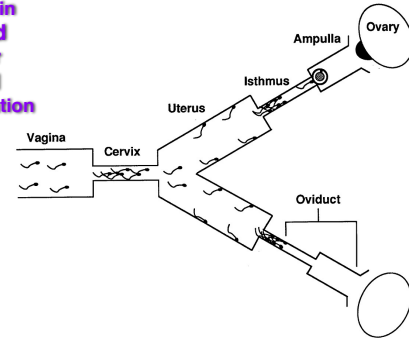
- retrograde flow
- phagocytosis by neutrophils

Neutrophil Infiltration of Uterus

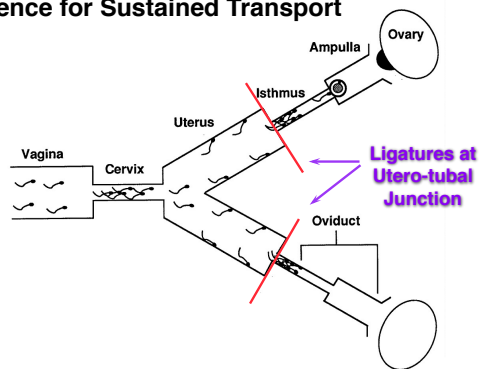


Phases of Sperm Transport

- rapid
» 15-30 min
- sustained
» 6 - 12 hr
- oviductal
» at ovulation



Evidence for Sustained Transport

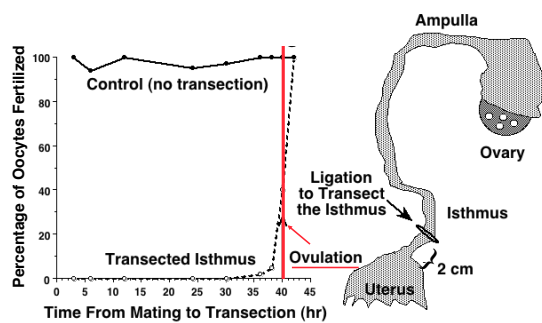


Effect of Oviduct Transection on Fertilization in Heifers

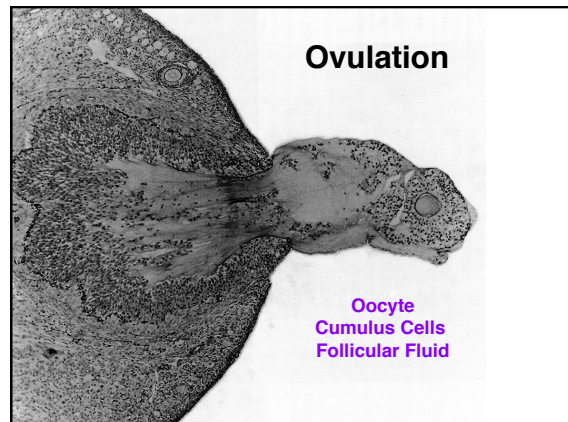
Interval from mating* to transection of UTJ	Oocytes Fertilized
6	0%
8	50%
12	83%

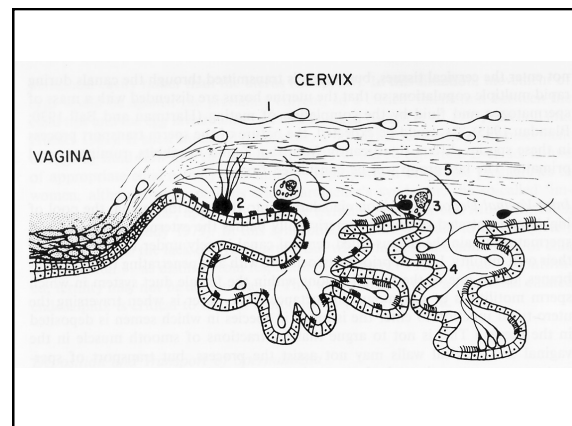
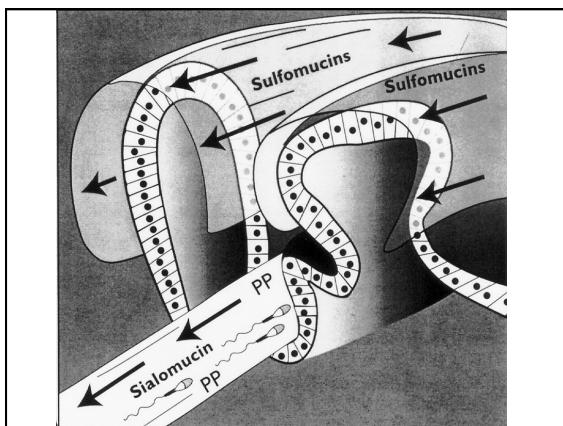
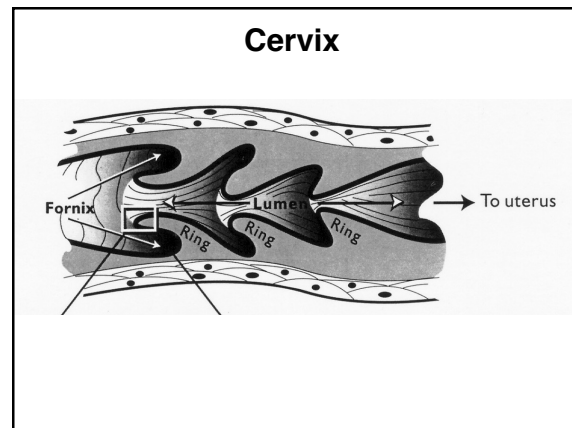
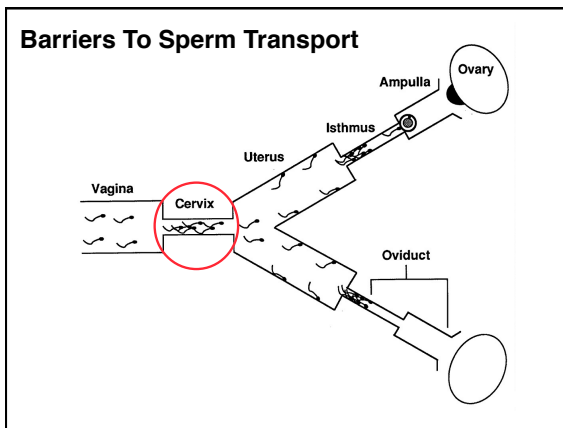
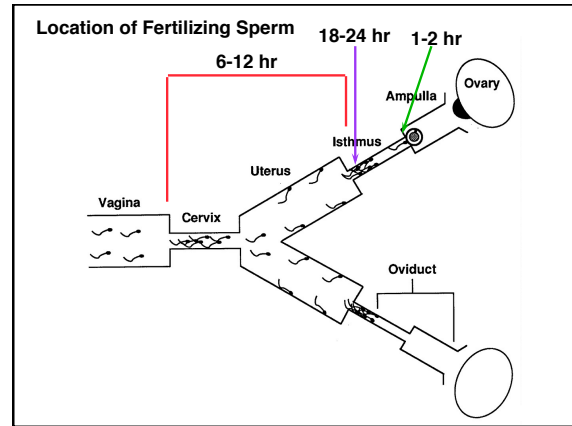
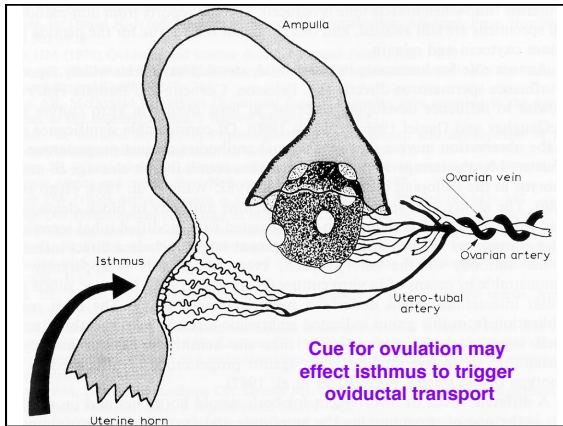
* Mating was done at the start of estrus.

Sperm Transport in the Pig

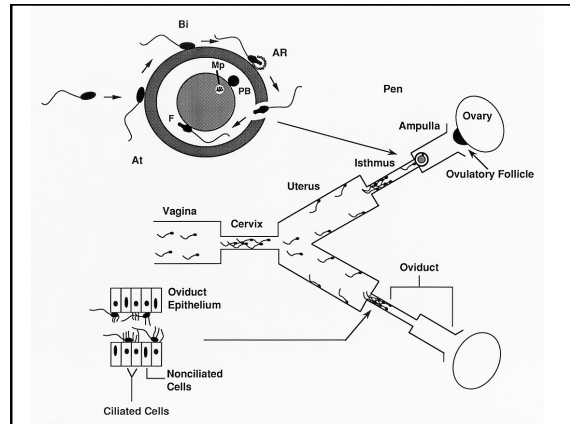
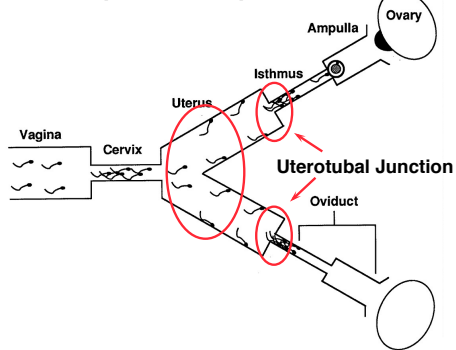


Ovulation

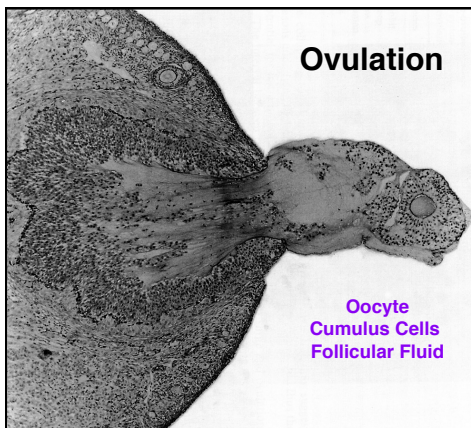




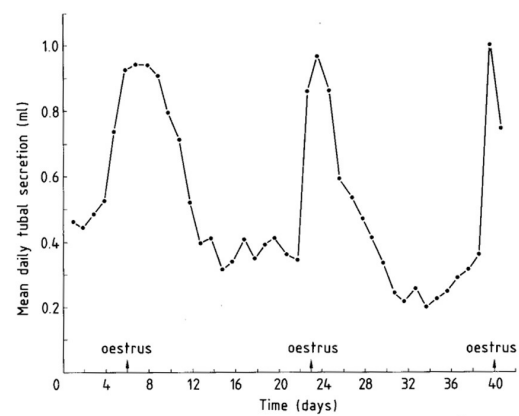
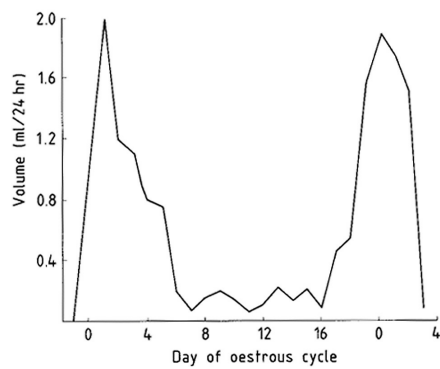
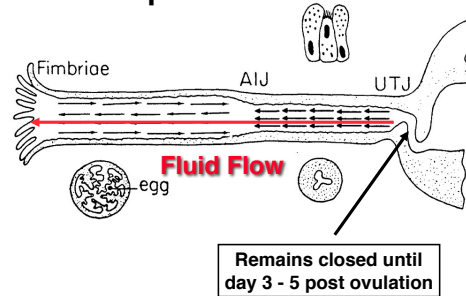
Barriers To Sperm Transport

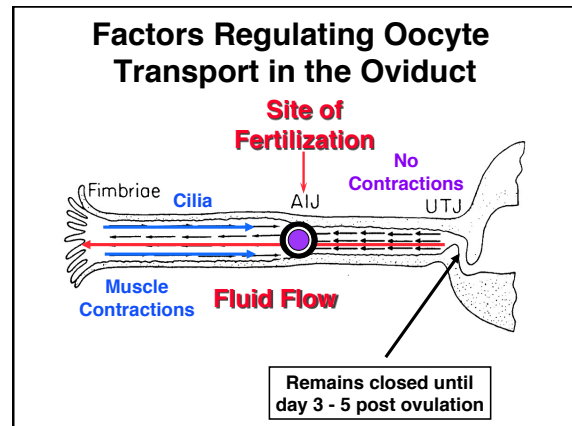
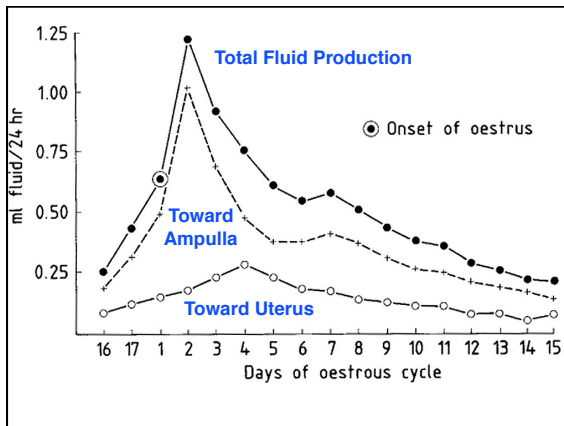


Ovulation



Factors Regulating Oocyte Transport in the Oviduct





**Now view the video
podcast entitled**

View Video on Ovulation and Oocyte Transport

Found at:

http://www.ansci.wisc.edu/jjp1/ansci_repro/lec/lec_16_gamete_tran/ovulation_oocyte_trans.html