• Reproductive cycle of the mare lasts 21 days
• Oestrus lasts five days (approx) oestrus behaviour is induced by oestrogen released from the developing follicle on the ovary.
• Follicle development takes about 5 days, then the follicle bursts releasing the egg into the fallopian tube, oestrus behaviour will cease shortly after.
• Thus the mare ovulates at the end of a 5 day oestrus. Oestrus behaviour in the mare comprises raising the tail, ‘winking’ the vulva, squatting and frequent draining of urine.
• After ovulation the follicle fills with blood forming a corpus haemorrhagicum, this then undergoes a process of luteinisation to form a corpus luteum.
• The corpus luteum produces progesterone which will inhibit oestrus behaviour.
• About 14 days later PGF2 alpha produced by the endometrium will cause luteolysis, progesterone levels will fall and a new follicle will start to develop and oestrus ensue.
The uterus of a mare is ‘T’ shaped with a body and two horns, which are not curved like a bovine uterus.

The ovaries of a mare are relatively large and often have several developing follicles, don’t mistake these for cystic ovaries which are generally not a problem in mares.

The oestrous uterus is soft and oedematous.

The anoestrous or early pregnant uterus feels much firmer.

The mare’s cervix is generally very slack and open in comparison to that of a cow.
Ultrasonographic appearance of a ripe follicle just before ovulation
Uterine oedema, folds of oedematous endometrium are a sign of oestrus
Ultrasonographic view of a 15 day pregnancy
After insemination or natural covering (mating) viable sperm will travel up to the fallopian tube and one will fertilise the egg. The fertilised egg will remain in the fallopian tube for 5 days, during which time the uterus will clear the remaining ejaculate via the cervix. After 5 days the fertilised egg (conceptus) will move down into the uterus. The conceptus will actively move around the two horns and body of the womb for the next 12 days, this is important in the maternal recognition of pregnancy. At 17 days old the conceptus will then become fixed and not move again. Usually it fixes at the base of one of the horns, occasionally it will fix in the body, such pregnancies’ body pregnancies are slightly less viable than normal.
Some mares have poor uterine immunity and develop endometrial infection after covering, older mares, particularly older maiden (never having given birth) mares can fail to clear the remaining ejaculate from the uterus after covering, ie will pool fluid in the uterus, resulting in endometritis and infertility. In both these cases it is advisable to flush the uterus out with sterile saline 5 hours after covering, by this time any viable sperm will be safely up in the fallopian tube and only dead sperm and ejaculatory fluid will be left in the uterus. The use of oxytocin at this time can also be helpful to cause uterine contraction to help expel the fluid.
Twin foals are rarely viable in mares they are usually aborted in the last few months of gestation, born dead or weak. This is best avoided by scanning at 14-15 days of gestation if there are twins one scan be killed by pinching or squashing with the scanner, this is done after the other twin has been gently moved out of the way with the scanner head. This must be done before 17 days as at that time the pregnancy will be fixed in place and if the twins are fixed in the same horn it is very difficult to kill one without damaging the other.
Twins fixed at 17 days
At 22 days the embryo can be seen and the heartbeat identified.

It is possible to sex the embryo at 65 days by locating the position of the genital tubercle.
25 day pregnancy
At approx 35days structures called the endometrial cups will form which secrete the hormone ecg equine chorionic gonadotrophin, which causes follicular luteinisation resulting in a second wave of corpora lutea which produce. Additional progesterone. This will prevent the mare from returning to oestrus even if the embryo. These will be destroyed by an immunological reaction at approx 120 days. From this point on the pregnancy is maintained by placental progestagens.
Semen Assessment

Normal ejaculate 60-80ml
A gel fraction is produced at the end of the ejaculate, this is filtered out of semen used for AI
100-800 million sperm /ml
60% motility
>1 billion morphologically normal and motility/ ejaculate
Normal insemination dose for AI is a minimum of 300 million normal motile sperm, thus several mares can be inseminated from a single ejaculation.
Semen is collected by diverting the penis into an artificial vagina as the stallion mounts a tease mare or dummy mare.
Artificial insemination in horses has some advantages over natural covering. It overcomes geographic barriers to the widespread use of stallions of high genetic merit, can help eliminate the risk of disease transmission and injury during natural mating. The use of frozen semen allows the use of stallions from all parts of the world, stallions can be used at stud without disturbing their competition season and even after their death. Chilled semen, correctly packed can be viable for up to 48 hours, frozen semen has indefinite viability. Not all stallion semen is suitable for freezing, this has individual variability, which can only be tested by freezing then thawing a sample for post thaw motility. There should be a minimum of 30% morphologically normal, progressively motile sperm post thaw.
Stallion selection is important in terms of correct conformation, temperament and performance. A sound biomechanically correct horse will have a longer working life and give a better economic return to his owner than a badly conformed horse who will be subject to lameness, this should be considered when choosing a stallion to cover a mare.
Challenging mares

• Non ovulatory haemorrhagic follicles
• Pneumovagina (‘windsuckers’)
• Chronic endometritis
• Poor endometrial immunity
• Fluid pooling in uterus after insemination
• Twinners
• Endometrial cysts
• Older maiden mares (stenotic cervix)
Poor vulval conformation, sloping vulva can be contaminated by faeces.
Caslicks operation to protect the vagina from contamination
Ultrasonographic appearance of uterine fluid, if this is not cleared naturally by the mare 5 hours after covering/insemination, oxytocin can be used to cause uterine contraction to clear the fluid, the uterus can also be lavaged with sterile saline.
Endometrial cysts
These are common and can be confused with an early pregnancy. Unless very extensive they have little impact on fertility.
Donkey

• Oestrous cycle 21-28 days
• Oestrous 2-10 days
• Gestation 12 months
Diseases of breeding

- Contagious equine metritis (CEM) Bacterial Taylorella equigenitalis
- (Equine viral arteritis)
- Equine herpes virus 1  common virus some strains can cause paralysis and abortion vaccine available.
- Equine herpes virus 3
- Dourine
- Streptococcus Placentitis
Equine Herpes Virus 1 (EHV 1)
A herpes virus causing respiratory disease, abortion and in the case of neurotropic strain, myelitis. Can cause an abortion storm on a stud farm and also result in the birth of weak, infected foals.
Equine herpes virus (EHV 3)
Mild sexually transmitted disease causing vesicles and ulceration, self limiting.
Equine Viral Arteritis

Conjunctivitis
Oedema
Abortion
Stallions can be carriers
Dourine
Trypanosoma Equiperdum

?Host specific immune response to T Evansii?

• Transmitted by mating
• Oedema of genital organs
• Neurological signs
• Oedema patches on skin
• Weight loss
• Abortion eventual death
Abortion causes...

- Twins
- Pregnancy in the uterine body rather than horn
- EHV
- Dourine
- Placentitis
- Foetal abnormalities
- Umbilical cord torsion
Uterine torsion

• Pre-cervical
• Late gestation
• Roll to try to turn uterus as in cattle
• Surgery
Granulosa cell tumour

- Large firm ovary
- Contralateral ovary small
- Acyclia, nymphomania, virility
- Inhibin levels raised (diagnostic)
Prepubic tendon rupture

Difficult to manage
• Support
• Induce parturition?
• Caesarian?
Stallion

• Inguinal hernia
• Orchitis
• Testicular torsion
Penile conditions
• Squamous cell carcinoma
• Habronema
• Trauma
• Prolapse
Castration

- **Open**
- **Closed** testes are emasculated within the tunica and tunica is ligated... Avoids the risk of eventration of intestine through the inguinal cannal.

**Cryptorchid**

- oestrone sulphate (not 3yo or donkeys)
- ecg stimulation: testosterone levels measured pre and 2 hours post injection of ecg
- Most undescended testicles are high in the inguinal canal or just inside the pelvis but can be high deep in the abdomen
Dr Ram has a video of the closed castration technique which has the advantage of eliminating the risk of eventration of the intestine, but requires general anaesthetic and good crushing and ligation for haemostasis.
Gestation period

Donkey 12-13 months, very variable

Horse 11 months,
Gestation 330-345 days

Signs of foaling...
- Pelvic ligaments slacken
- Udder development

Approx 24 hours prior.....
- ‘Wax up’, ie waxy secretion at teat orifices
- Electrolyte concentration in milk
  - Calcium >10mmol/l
  - Sodium <40mmoll/l
Parturition stage one preparation

‘Waters break’
Allantoic fluid expelled
Mare is restless
May sweat
Stage Two

- Amnion appears at vulva
- Usually head and two front legs
- Mare has forceful contractions and normally foals within 20 minutes
Potential problem
Placenta fails to rupture
‘red bag delivery’
Emergency.... must cut open placenta to allow delivery of foal
Malpresentation
Clean
Lubrication
Time is very limited for successful outcome
Mare has very forceful contractions!
If difficult malpresentation or if embryotomy is necessary may need to:
- Administer an epidural
- Administer a general anaesthetic
- Pass a stomach tube down trachea to prevent her holding her breath to force
- Correction of a malpresentation can be facilitated by raising her hindquarters when anaesthetised e.g. using a tractor front loader or rope over a beam. This allows the foal to be pushed back into the abdomen sufficiently to allow room to correct the malpresentation.
If amnion doesn’t break tear it to allow foal to breathe.

Blood will continue into umbilical artery after birth before cord breaks ... leave alone!!
• Foal should stand within one hour

• Suck within two hours

• Treat umbilical stump with dilute iodine or 0.5% chlorhexidine in 10% surgical spirit
  - better
Stage Three ‘cleansing’

If placenta not expelled in 6 hours
• Oxytocin to cause uterine contraction
• Twist placenta to breakdown attachment, don’t pull, may leave some behind
• Lavage with fluids to help loosen and encourage uterine contraction
• Antibiotics
• NSAIDS

Risk associated with retained placenta in the mare..
• Endotoxaemia
• Laminitis

These can be fatal complications
Examine placenta to ensure all has been expelled
Even a small remnant can cause a fatal endotoxic endometritis, ensure both horns are present with none missing
The structure of the placenta in the mare is microcotyledenous, it has a rough velvety appearance
Colic in the periparturient mare

- Stage one parturition
- Stage three parturition
- Caecal perforation
- Mesocolon rupture
- Uterine torsion
- Large colon torsion
Periparturient colic

- Uterine horn invagination
- Uterine rupture
- Broad ligament haematoma
- Mesocolon rupture
- Bladder rupture
- Bladder, uterus, rectal prolapse
Agalactia

• Ensure adequate nutrition

• Domperidone (dopamine antagonist)

• Cocoa? Annecdotal
Mastitis

• Udder hard, hot and painful
• 2 orifices per teat ensure milk from both

Treatment...
• Antibiotics
• NSAIDS
• Strip out udder frequently
• Oxytocin
Uterine prolapse

- Clean
- Epidural
- Replace
- Distend with fluid
- Antibiotics

Bladder prolapse clean then replace