(kilpa)tammastani mamma
Anivet 29.3.2014

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10 steps to the successful pregnancy of your mare

1. Choose the right mare
2. Choose the right stallion
3. Choose the right place to breed
4. Prepare your horse for the breeding season
5. Choose the right semen presentation
6. Choose the appropriate insemination program
7. Get the timing right
8. Fight bacteria
9. Stick to the program
10. Keep stress to a minimum

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The mare cycle

…Tamman kiimat – mare's heat

- The average length is three weeks, with most falling within the range of 18- to 23-day cycles. The mare will be in season ("show heat") for an average of five days during each cycle, with a range of three to seven or eight days. Many people complain that their mare is in season every two weeks and think that's abnormal, but it's not. The normal cycle is for the mare to be in season for the better part of a week, followed by two weeks out, then another week or so in.

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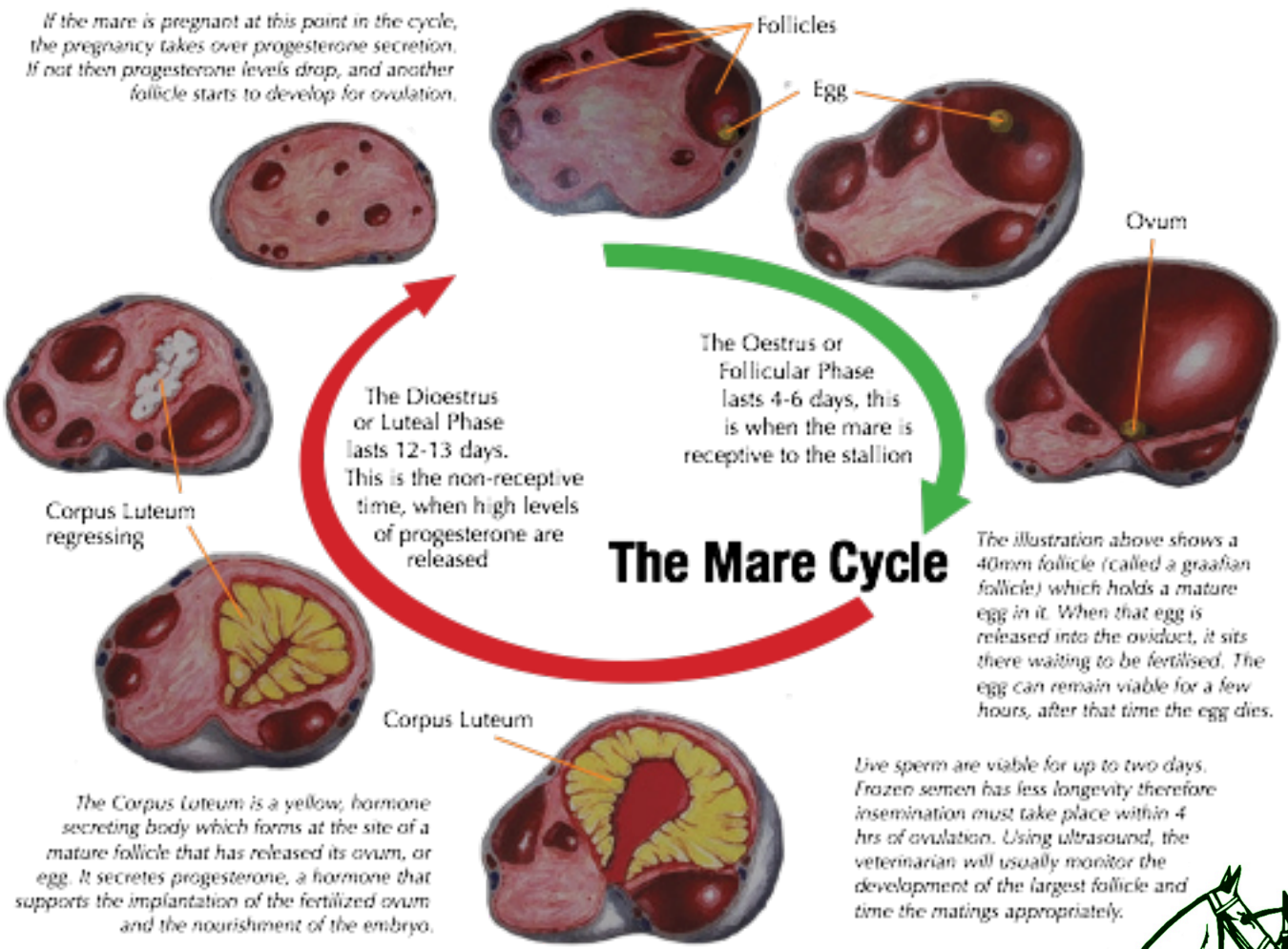

… tamman kiimat ja hormonit…

- The cycle is controlled by several hormones which regulate the estrous cycle, the mare's behavior, and the reproductive system of the mare..The cycle begins when the increased day length causes the pineal gland to reduce the levels of melatonin, thereby allowing the hypothalamus to secrete

- GnRH (Gonadotropin releasing hormone) causes the pituitary to release two gonadotrophins:
  - LH (luteinizing hormone) are highest 2 days following ovulation, slowly decrease over 4-5 days, being lowest 5-16 days after ovulation. Stimulates maturation of the follicle, which then in turn secretes estrogen.
  - FSH (Follicle-stimulating hormone) causes the ovarian follicle to develope.

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… tamman kiimat ja hormonit…

- Estrogen: secreted by the developing follicle, it causes the pituitary gland to secrete more LH (therefore, these 2 hormones are in a positive feedback loop). Additionally, it causes behavioral changes in the mare, making her more receptive toward the stallion, and causes physical changes in the cervix, uterus, and vagina to prepare the mare for conception (see above). Estrogen peaks 1–2 days before ovulation, and decreases within 2 days following ovulation.
- Inhibin: secreted by the developed follicle right before ovulation, "turns off" FSH, which is no longer needed now that the follicle is larger.
- Progesterone: prevents conception and decreases sexual receptibility of the mare to the stallion. Progesterone is therefore lowest during the estrus phase, and increases during diestrus. It decreases 12–15 days after ovulation, when the corpus luteum begins to decrease in size.
- Prostaglandin: secreted by the endrometrium 13–15 days following ovulation, causes luteolysis and prevents the corpus luteum from secreting progesterone
- eCG - equine chorionic gonadotropin - (also called PMSG (pregnant mare serum gonadotropin): chorionic gonadotropins secreted if the mare conceives. First secreted by the endometrial cups around the 36th day of gestation, peaking around day 60, and decreasing after about 120 days of gestation. Also help to stimulate the growth of the fetal gonads.
- Prolactin: stimulates lactation
- Oxytocin: stimulates the uterus to contract

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Control of the estrus cycle

- Day length is what drives a mare's seasonal patterns of breeding. During periods of longer day length the mare cycles. You can keep a mare cycling by putting her under lights at night during the fall and winter. Oddly, the light is more effective if added at the end of the day rather than the beginning. It is recommended you turn them on an hour before dark and leave them on till 11pm.

- If a mare is allowed to enter anestrus it will take about 60 days of light to get her back ovulating.

Best times to breed your mare…

- The mare's heat cycle is referred to as equine estrus, estrous or oestrous cycle. It is the period of time which she will produce a fertile egg (or ovulate) and will accept a stallion. A mares best times for coming into heat are the warmer and longer days of the year, such as mid to late spring and the summer months.

- Most mares will come into heat every 21 days. Usually 21 days after the day the mare first comes into heat, she will start into heat again, but some mares vary anywhere from 18 to 31 days in their heat cycles. Heat periods are generally longer earlier in the breeding season and many older mares have longer than average heat cycles.

- Ovulation, or the period of time when the mare is fertile and can conceive a foal generally only occurs **24 to 48 hours before the mare goes out of heat**. Thus no matter how long she is in heat, **ovulation will only occur shortly before the end of her heat cycle**. Sperm will only live in the mare's reproduction tract for about 24 hours, so it is **absolutely necessary to breed her shortly before she goes out of heat**. It is best to breed the mare on the second day of her heat cycle and then breed her every other day until she **goes out of heat**. That way she will have live sperm in her genital tract when the egg is released from the ovary.

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…Best times to breed your mare.

- Mare's that have just foaled will come into heat about 9 days after the foal is born, but sometimes this varies from 4 to 18 days. This is called the "foal heat". You can breed her at this time if she foaled cleanly and without complications. If she had problems foaling, then you should at least wait until her next heat period which will usually occur 18 to 21 days after the foal heat. This will give her time to heal and get ready to rebreed.

- A mare is not too old to breed if she is in good health and if bred to a stallion expected to produce a foal of normal size. Foaling or birthing is easier on younger mares because their pelvis is held together with more cartilage than bone. You should keep a closer eye on an older bred mare.

- Please note: All mares used for breeding should be examined and under a veterinarians supervision. The above tips are not meant as a diagnosis, treatment advise or replacement for the medical advisement of your veterinarian. It is offered as a general informational resource based on personal experience and study.

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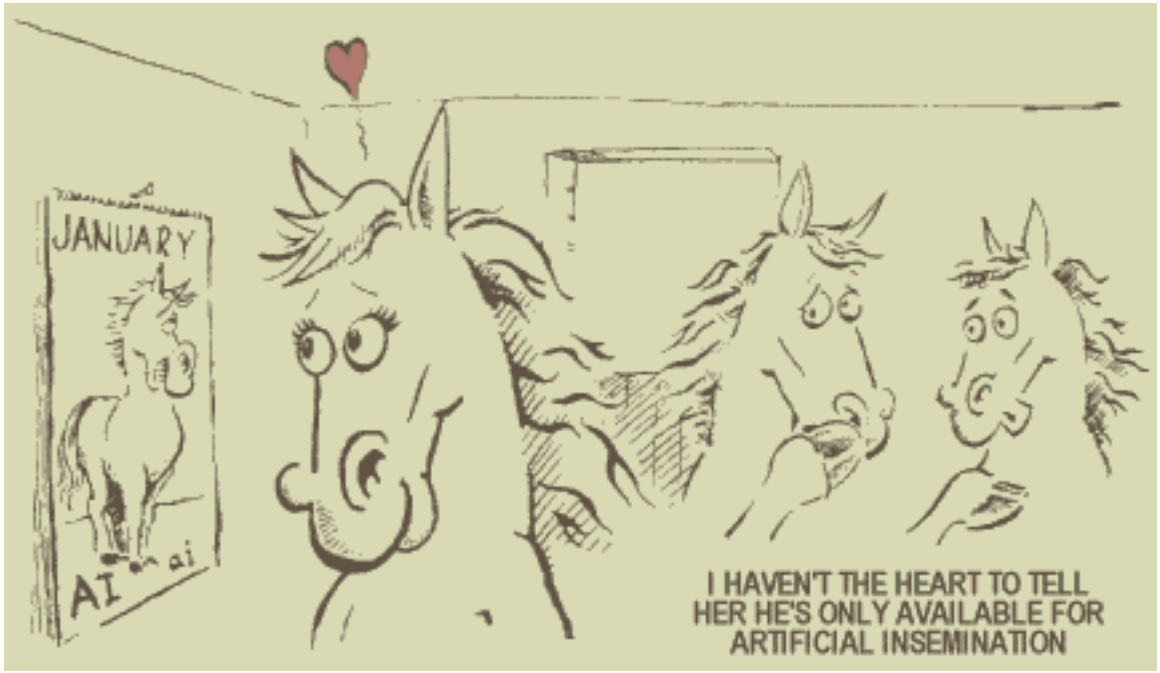
Artificial insemination



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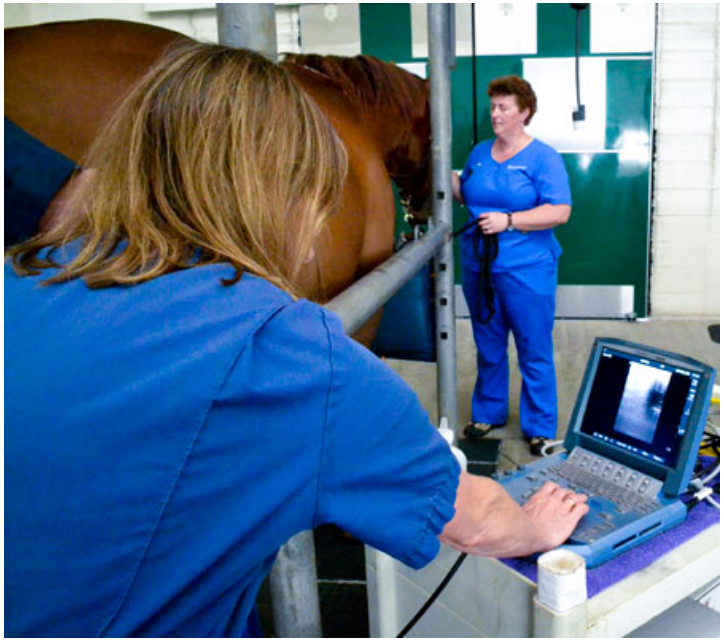
Artificial insemination



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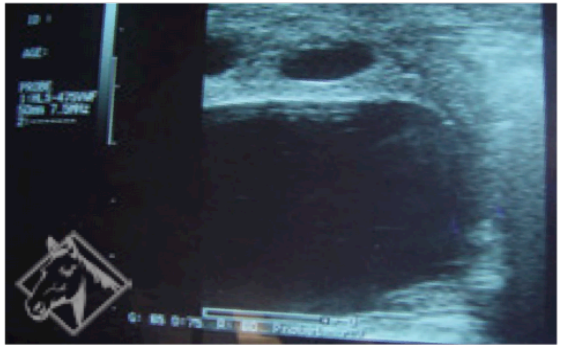
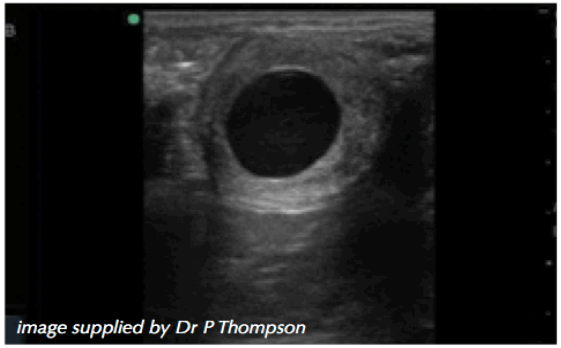
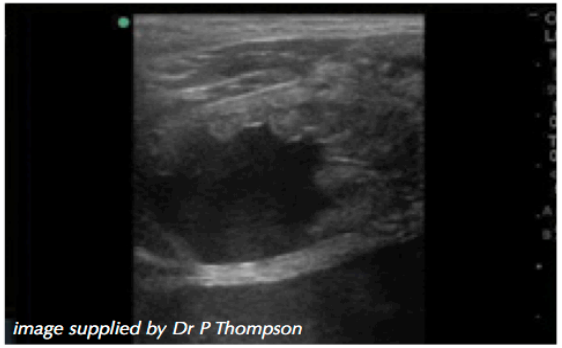
Insemination and pregnancy



In this ultrasound image, the large dark hole shows a 50mm follicle about to release the egg.



This ultrasound image is of a 17 day pregnancy.



This is a 21-22 day pregnancy implanting on the uterus wall

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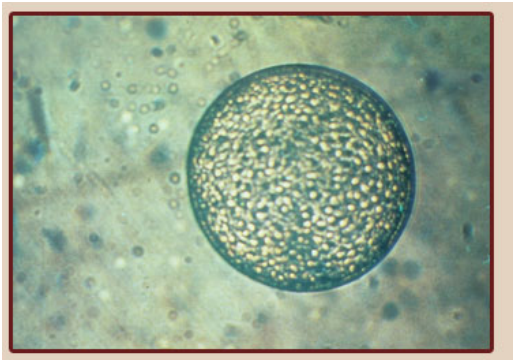
Embryo Transfer for Horses

- One plus one plus one equals one. The stallion, dam, and surrogate dam probably never met, but all three contributed to produce a foal. Today's assisted breeding technologies can overcome the constraints of distance, competitive involvement, reproductive health, and the calendar.
- Embryo transfer is based on your mare conceiving a foal, then donating the embryo to a surrogate dam. The surrogate carries the foal to term and delivers it.
- Your donor mare must be capable of ovulation, and her egg must become fertilized by the stallion's sperm. When she donates the developing embryo, removed through a collection process, her task is complete.
- You need to be aware of your mare's estrous cycle, specifically when the mare ovulates, as the age of the embryo is based on the day ovulation occurred, or Day Zero.



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Benefits of the embryo transfer

- You might own a mare which conceives, but cannot carry or deliver a live foal.
- She may be unsound, aged, injured
- She is needed to perform as an athlete.
- A likely candidate would also be an older mare with a history of conceiving and later aborting. She is likely to provide a fertilized egg for embryo collection.

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… benefits of the embryo transfer…

- decreases foaling risk
  - In some older mares, the uterine artery ruptures and hemorrhages at the time of foaling. It can be fatal in the immediate post-foaling period. Some mares survive that first episode of uterine artery tear, but they're at greater risk of suffering rupture at a subsequent foaling. Embryo transfer minimizes the mare having to carry successive pregnancies.

…benefits …

- Embryo transfer also allows your per-formance mare to continue her athletic career while reproducing.
- In the performance mare, lactation limits the mare's ability to continue showing or racing.

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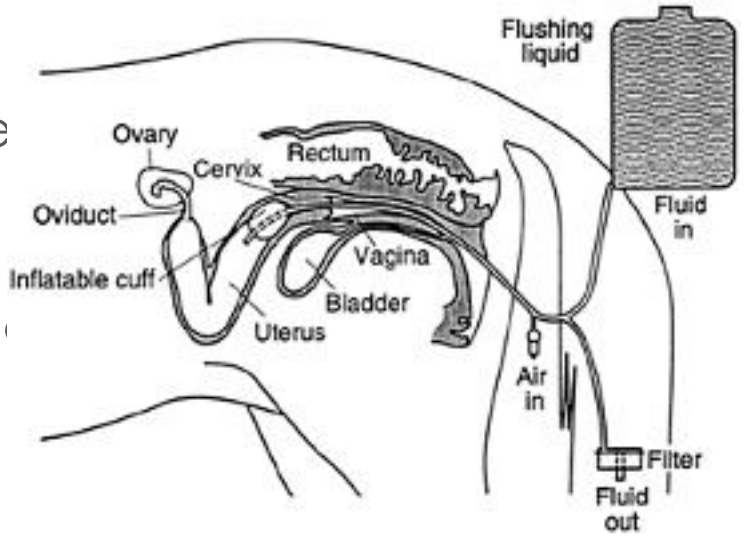
Collecting process

- The collection process is non-surgical, performed by flushing the embryo from the uterine lumen
- Catheter is placed through the vagina and through the cervix, an an inflatable cuff on the catheter provides a fluid-tight seal. The solution passes down through a tubing system into the uterine lumen.
- The fluid and embryo pass out through the tubing system, into and through an embryonic filte



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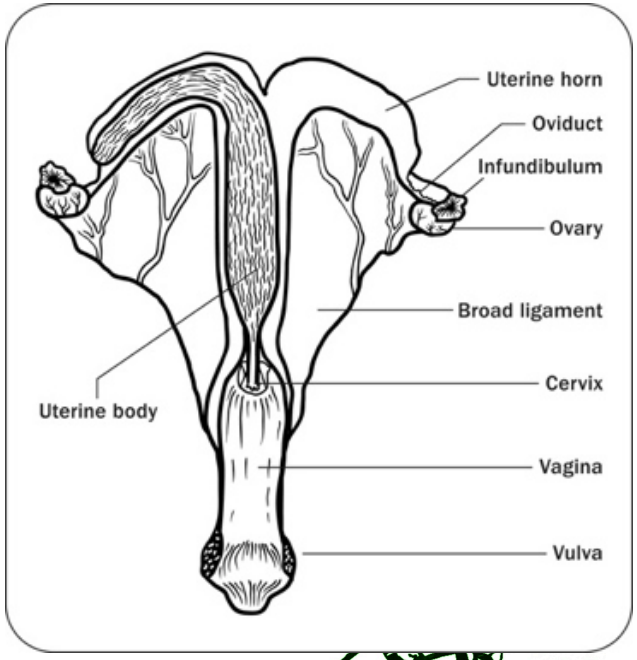
Surrogate dam

- The surrogate dam must be ready to accept the embryo--her estrous cycle needs to be synchronized with the donor mare's cycle. The surrogate ovulates either one day prior, the same day, or one to three days after the donor mare.
- There needs to several recipient mares, certified through their age (5 to 12) and a thorough reproductive examination. Their estrous cycles are recorded to match them with expected donor mares. If the cycles don't match, the laboratory uses hormonal therapy to synchronize ovulation.



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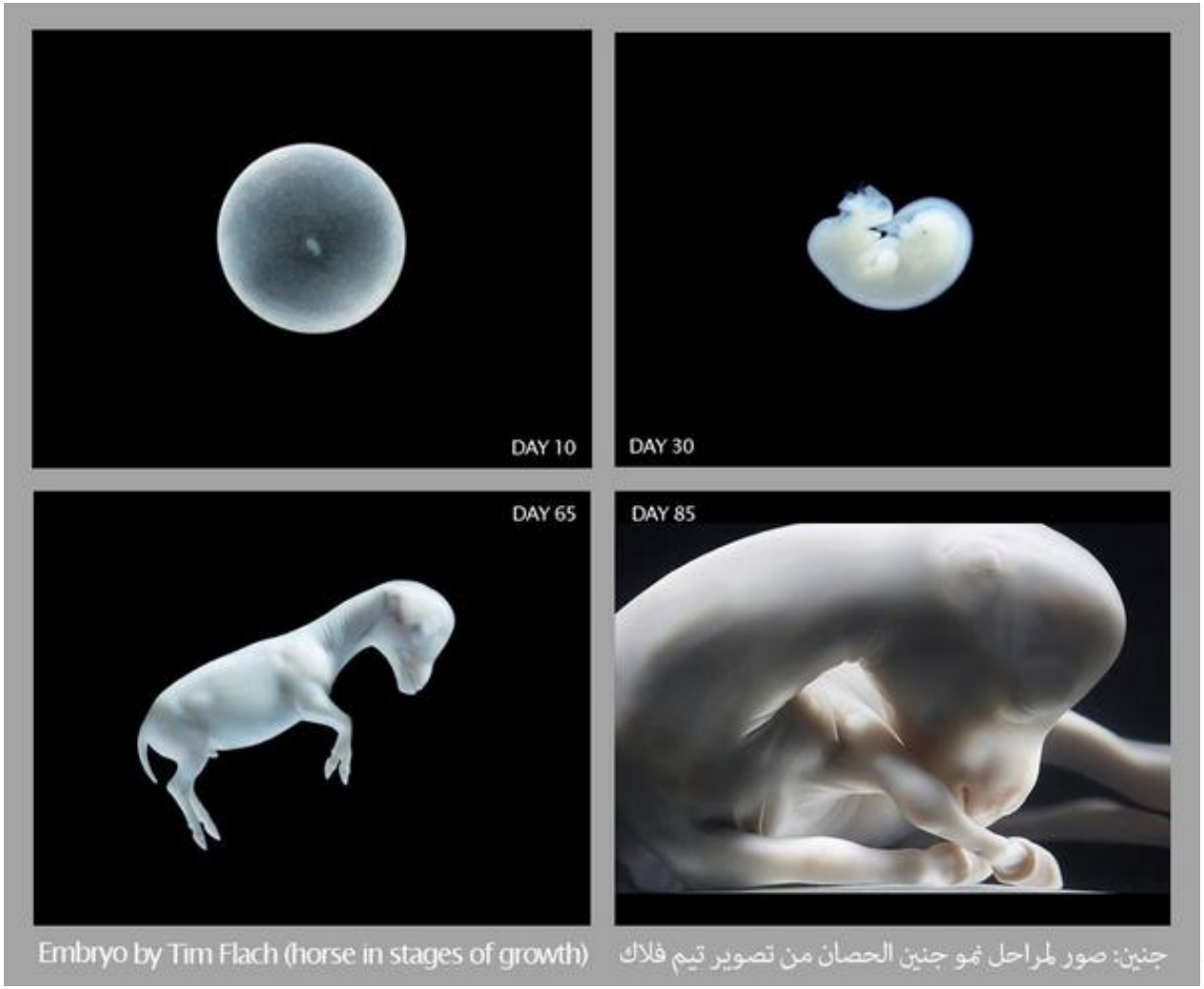
Life before birth!



Embryo by Tim Flach (horse in stages of growth)

جنين: صور لمراحل نمو جنين الحصان من تصوير تيم فلاك

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Financial aspects…

- Embryo transfer requires advance planning.
- Timing is everything – you need a close relationship with the vet to get the heats syncronized – might be expensive if/when several or many visits are needed!
- Acquiring/loaning and handling the ”herd” of the surrogate mares until the one is chosen to carry the foal – then providing home for the surrogate dam

Mare's pregnancy

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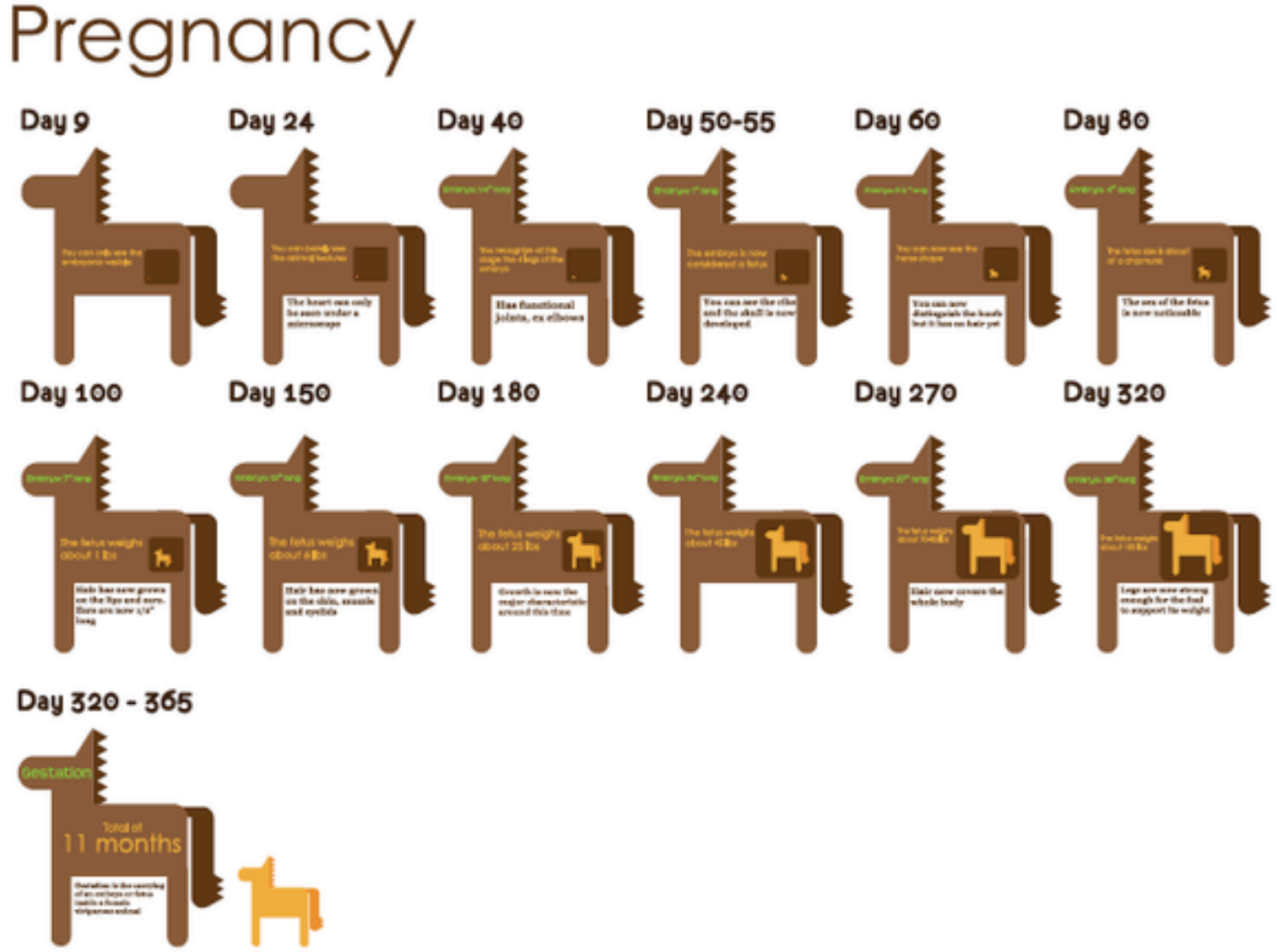
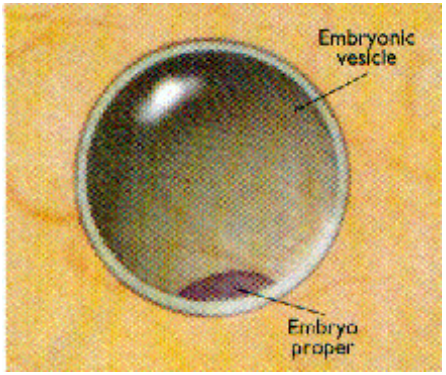
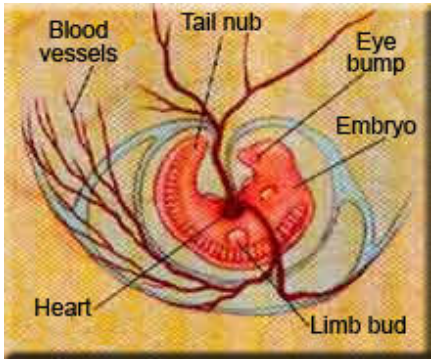
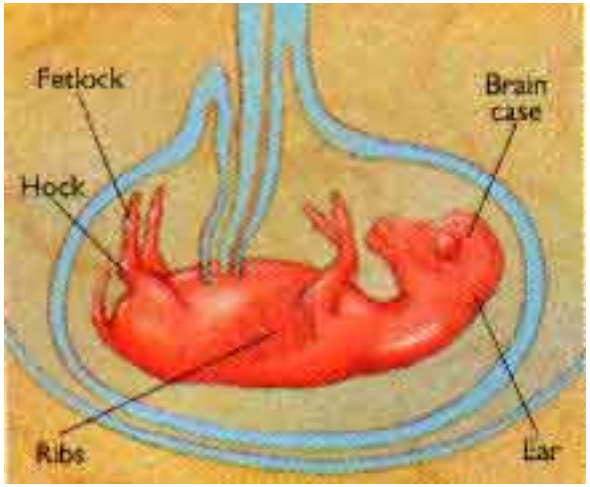
Mare pregnancy



Embryo becomes foal…







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Signs and risks

- Sometimes abortion is totally without any signs
- Some signes:
  - Mare is restless
  - Discharges liquid from vulva
  - Milk coming from glands early before birth (months 7-8) can be sign of endometrities or placentitis
- There is no prevention of abortion when the process have started ☹

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Risk during the birth

- The location of the foal – normal is to come with front legs and head on the top first
  - If you see only one leg or can't see the head, call the vet!
- If the amnion is not broken, you should help the mare to break it
- Taking care of the placenta

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… birth…

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… birth…

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First hours… days…. weeks

- **Key Points**
  - The highest rate of death for horses is in the first 2 days of life
  - The key to managing your foal through this period is **P**reparation, **P**roblem recognition and **P**rompt intervention (3Ps)
  - Have a veterinarian examine your foal within 12-24 hours of birth
  - The biggest killer of foals relates to infection
  - Make sure your foal gets colostrum
  - Make sure your veterinarian gives your foal plasma (stock some yourself)

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Vasta-aineet - Antibody Transfer

- The foal relies on absorption of antibodies from the mare's colostrum for early life protection against many bacterial and viral pathogens that cause infections. This transfer is especially critical for resistance to disease in the first two to four months of life.

- There are several potential causes for failure of passive transfer of antibodies, including:
  1. Low antibodies levels in the mare's colostrum.
  2. Colostrum leakage from the udder prior to the foal birth.
  3. Failure of the foal to absorb colostrum (usually induced by the stress caused by ingesting protein substances before nursing colostrum).
  4. Failure of the foal to nurse prior to eight hours of age.
  5. Premature birth of the foal.

Healthy foal = happy foal, mum and the owner!

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hevosesi hyvinvointi on meille tärkeää!

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