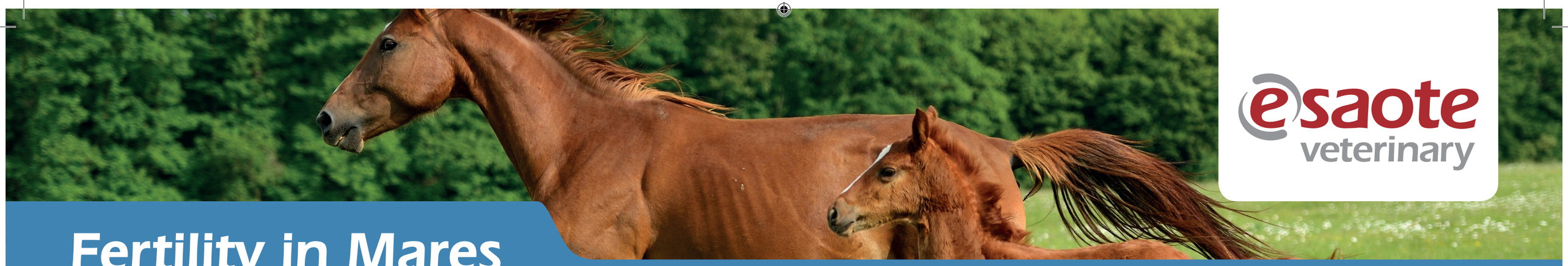


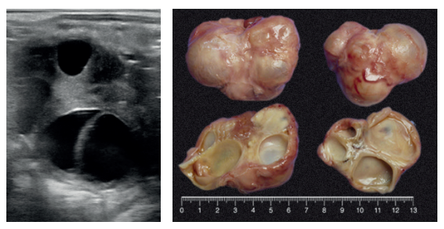
Fertility in Mares

The non-pregnant Mare

Ultrasound Examination of the Reproductive Cycle

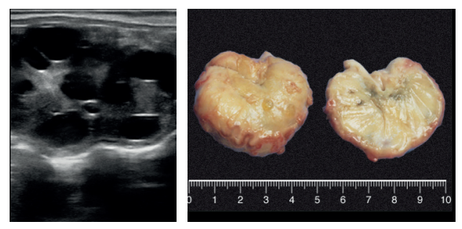
Transitional Phase

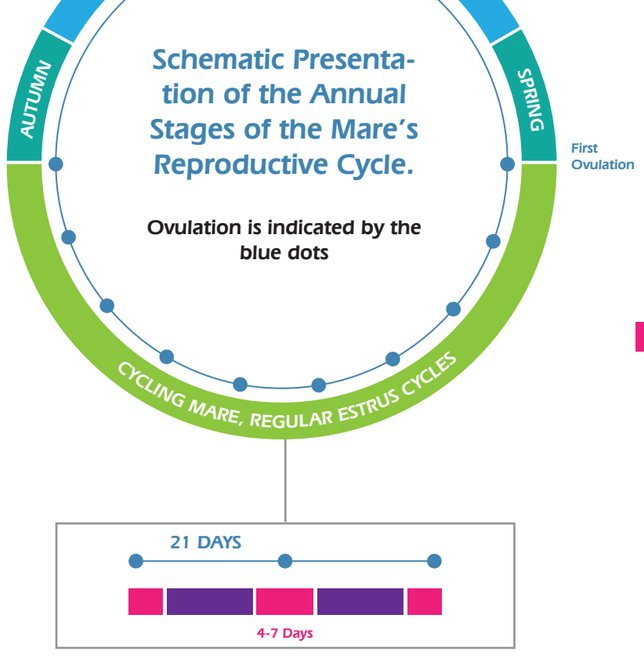
Multiple large follicles on both ovaries, edema in uterus can vary due to differences in follicular activity and estrogen concentration.



Anestrus

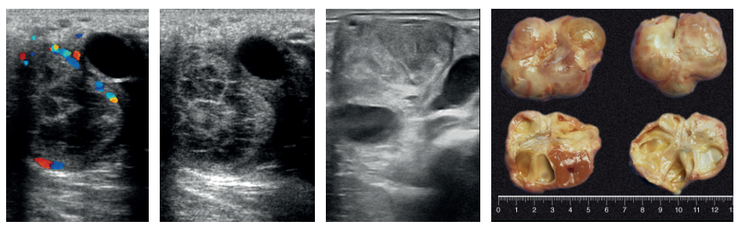
Ovaries small and inactive, uterus very soft, flattened without edema.





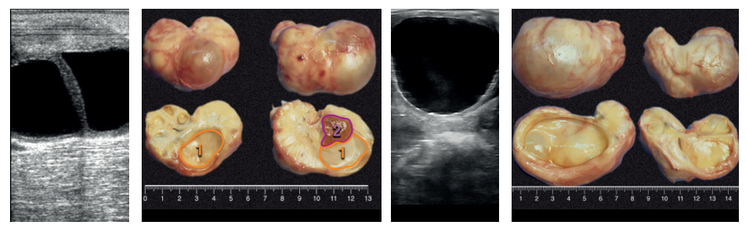
Diestrus

A corpus haemorrhagicum and later corpus luteum can be visualized. Functionality of the CL can be determined by Doppler ultrasound. The uterus is small, firm, round and homogenous.

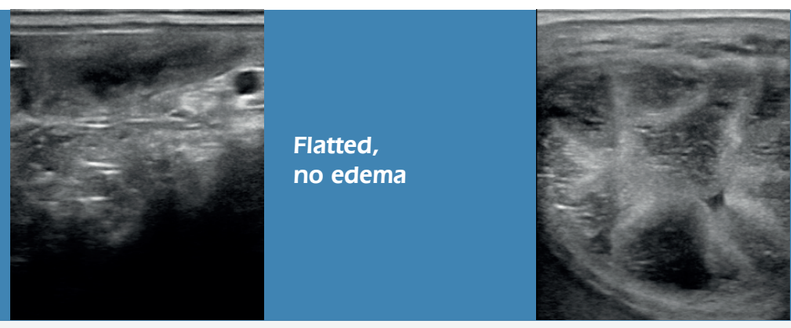


Estrus

Dominant follicles at midstage of estrus. Depending on the stage of estrus and the individual pattern of the mare, various grades of edema can be visualized in the uterus.



Varying stages of edema of the uterus



Flatted, no edema

Moderate edema

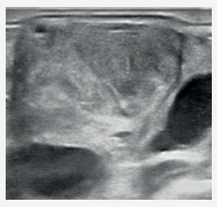
Obvious edema

Extreme edema

The pregnant Mare

Ultrasound Examination Time Line

START

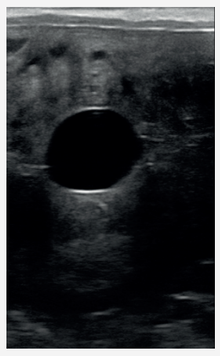


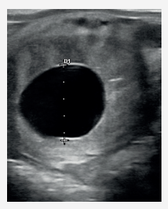
Day 11

Yolk sac is first visible by ultrasound. Functional CL(s) on one or both ovaries are visible by ultrasonography. Scanning for cysts before pregnancy is important, to avoid confusion.

Until day 16

Mobility phase: embryo migrates through the entire uterus.



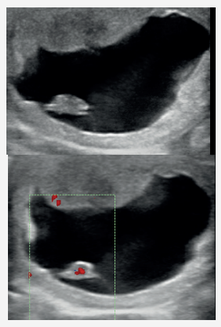


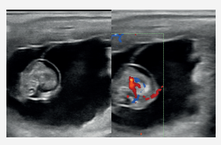
Day 14-16

First US examination: ensure presence of one or two embryonic vesicles. Examine the ovaries for multiple luteal structures. Multiple conceptuses can still be separated and crushed. After crushing: examine the mare again 2-3 days later.

Day 16-17

Fixation phase: embryo fixates itself at one of the boundaries corpus uteri – uterus horn.



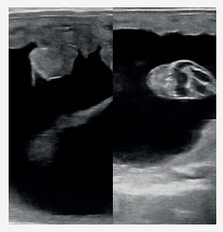


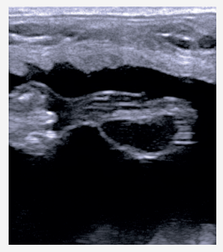
Day 25-35

Second ultrasound examination: confirm diagnosis of pregnancy. Conceptus can be distinguished from a endometrial cyst by presence of an embryo proper. Heart beat becomes visible from day 23.

Day 35

Formation of endometrium cups: fetal cells migrate to endometrium and produce Equine Chorionic Gonadotrophin.





Day 40-120

Endometrium cups act autonomically and produce eCG. eCG has predominately an LH function and supports the maintenance of the primary CL and the development of secondary CL.

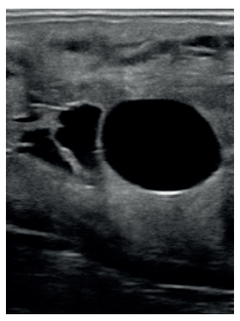
Day 55-80

Fetal sex can be determined by rectal ultrasonography.

Common Abnormalities on Ultrasound

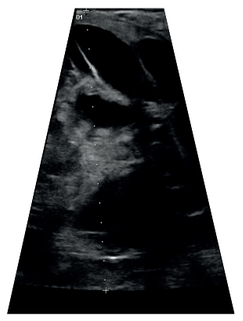
Endometritis and Endometrial Cysts

Differences in the amount of uterine fluid, echogenicity and edema.



Endometrial Cysts

Looks like a pregnancy. Can obstruct the uterine lumen leading to failure of maternal recognition of pregnancy, or they can lead to early embryonic death.



Granulosa Cell Tumor

Due to inhibin production of the affected ovary, the contralateral ovary will be very small. GCT can produce estrogens or testosterone leading to behavioural changes.

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Ultrasound pictures with special thanks to: W.K. Hendriks, DVM Dipl. ECAR. Scientific Sources: 1) England, Gary C.W. Fertility and Obstetrics in the Horse, third edition, England, Blackwell publishing (2005); 2) Hendriks, W. K. & Stout, T.; Esaote MyLibrary Equine Reproduction – Mare, Version 1.0, Esaote Europe BV, (2009). 3) Faculty of Veterinary Medicine, Utrecht University, Syllabus Voortplanting en Obstetrie (2011) - Esaote Veterinary 160000155