

FOALING GUIDE

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Foaling season is an exciting time. The journey that started almost 1 year before with selection of the right stallion for each mare, intensive breeding management, and patient care of the pregnant mare, finally concludes. Most foalings proceed uneventfully. However, about 10 % can have complications. A complicated birth should always be regarded as an emergency. Apart from potential loss of the foal or mare, the mare's fertility can be compromised. Because the placenta separates rapidly during foaling, any delay in fetal expulsion results in a rapid decrease in oxygen supply to the foal. Survival rate of foals after a complicated birth is low unless immediate attention is available. Even foals born alive have a high rate of neonatal death after complicated births. The presence of the fetus in the birth canal for a prolonged time and the obstetrical manipulations invariably result in lacerations of the birth canal and contamination of the uterus with bacteria. This reduces fertility of mares bred in foal heat and prolongs the interval from foaling to conception. Early identification of the mare with complicated birth is critical to protect your emotional and economical investment and improve the neonatal outcome.

Getting ready for foaling

Prevention of complications starts with appropriate conditioning of the mare for foaling. Approximately 4 to 6 weeks before expected foaling date, the mare should be moved to the foaling area. At this time, it is advisable to vaccinate the mare (Equine herpes virus 1, Eastern Equine Encephalitis, Western Equine Encephalitis, tetanus, killed West Nile Virus, equine influenza) to provide protective antibodies to the foal via colostrum. Mares that have a Caslick's suture in place should have the suture removed 2 to 4 weeks before the expected foaling date to avoid vulvar tears during foaling.

During the last month, the mare should be monitored for physical changes indicative of imminent foaling (Table 1). The timing of appearance of these changes can vary and even though they indicate proximity of foaling they are not reliable indicators of its exact date.

Table 1: Changes associated with proximity of foaling

Change	Time prior to foaling
Vulvar and pelvic ligament relaxation	1 to 3 weeks
Mammary gland development	4 to 6 weeks
Lactation	2 to 14 days
Teat engorgement	24 to 48 hours
Waxing	6 to 72 hours
Call a veterinarian if lactation is initiated \leq 300 days of gestation	



Mammary gland development and waxing (left) and relaxation of the pelvic ligaments (right)

The average length of gestation in mares is 340 d. However, gestation length is highly variable and normal term foals can be delivered after 320 to 360 d. Fetal maturation only occurs in the last 2 to 4 days pre-partum. Monitoring changes in milk calcium concentration is a valuable tool to assess fetal readiness for birth since these changes are related to fetal maturity. Milk calcium concentration can be monitored using commercial stall-side tests (FoalWatch Test Kit™, CHEMetrics, Inc., Calverton, VA). These tests are performed once or twice a day starting as soon as the mare has mammary gland secretions. Calcium carbonate concentrations <200 ppm indicate a 99% chance that the mare will not foal within 24 hours. Concentrations >200 ppm indicate a 97% chance that the mare will foal within 72 hours. This information allows breeders to be present during foaling and detect problems early. There are also a number of alarm systems in the market. The most reliable system is Foalert® (Foalert, Inc., Acworth, GA). The transmitter is sutured to the vulva and the alarm goes off when the fetal membranes or foal pass through the birth canal.

How do I know something is wrong?

During the first stage of labor, mares normally show signs of colic, sweating, frequent urination and defecation, and restlessness. These signs are caused by increasing intensity and frequency of uterine contractions. In response to uterine contractions, the foal repositions itself and begins to extend its forelegs, neck and head. Cervical relaxation also occurs during this stage, which lasts on average 50 minutes, with a range of 30 minutes to 6 hours.

As the fetus passes through the cervix into the birth canal, the chorioallantois ruptures and a large volume of fluid is forcefully expelled through the vulva. We say that the mare “breaks water”. The fetus should be delivered within an average of 20 minutes, with a normal range of 10 to 40 minutes after breaking water.

In normal foalings, the chorioallantois ruptures and it is the amnion what appears through the vulva. The amnion is a transparent bluish white membrane, while the chorioallantois is a red velvety membrane. In some instances, the chorioallantois fails to rupture and the red velvety membrane appears through the vulva. This condition is called premature placental separation or “red bag”. This is an emergency because the chorioallantois separates from the uterus, depriving the foal from oxygen supply. Because the foal is still within the membranes, it

cannot breathe and suffocates. If you are dealing with a red bag delivery, break the chorioallantois manually or cut it with scissors, and deliver the foal using gentle traction. A veterinarian must be contacted immediately since the foal will very likely need immediate support. However, if your veterinarian is several minutes away, do not wait to rupture the membrane and deliver the foal. Any delay will likely result in fetal death.

Once the mare “breaks water” the amnion or fetal parts should be visible through the vulva within 5 minutes. Any delay should be a cause of concern. Delays at this point usually occur when the fetal limbs or head are flexed and are not entering the birth canal. The amnion is usually delivered intact and it is ruptured by fetal movements once the foal is midway through the birth canal. If this does not happen, the amnion should be manually ruptured and removed from the area of the nose and mouth to allow the foal to breathe.



Normal foal disposition and transparent bluish white amnion (left). Unruptured red velvety chorioallantois in a mare with “red bag” (right).

After the amnion appears through the vulva, the foal should progress through the birth canal such that advances are evident every 10 minutes. If this does not happen, your veterinarian must be contacted immediately. Common causes of delay at this point are elbow flexions or impaction of one or two rear limbs into the birth canal.

If the foal is in the correct disposition, the head and front limbs should appear first (anterior presentation) and fully extended, so that the head rests between the two carpi. One forelimb usually extends about 4 inches in front of the other. The offsetting of the feet results in an angling of the shoulders reducing the width of this area to facilitate passage through the birth canal. The soles of the hooves appear through the vulva facing the ground. If the soles are facing up, the foal can be upside down. Foals in that position cannot be delivered vaginally unless they are rotated. Another reason for the soles to be facing up is posterior presentation (tail first). Posterior presentation is associated with higher foal mortality since the umbilical cord becomes compressed against the mare’s pelvis reducing oxygen supply. Foals in posterior presentation should be delivered by traction as soon as possible. If an ultrasound is performed during the last month of gestation, it is possible to determine if a foal is oriented in anterior or

posterior presentation. Any deviations from normal fetal disposition should be a cause of concern and a veterinarian must be contacted immediately. Some common abnormalities are flexions of the head, neck or limbs.

Table 2: Summary of normal and abnormal events during foaling

Normal events	Call a veterinarian if
The red chorioallantois breaks and fluid is expelled (water breaks). The white amnion or fetus appears within 5 min.	<ul style="list-style-type: none"> • A red membrane appears through the vulva. • No fetus or amnion appears within 10 min of breaking water
The foal is expelled within 10 to 40 min of breaking water.	<ul style="list-style-type: none"> • Foaling is not complete in 40 min
The extended head and front limbs appear first, the foal's belly and hoof soles face the ground.	<ul style="list-style-type: none"> • Head, neck or limbs are flexed • The foal is upside down • The soles face up
The foal stands up in 1 h and nurses in 2 h	<ul style="list-style-type: none"> • The foal is not up and nursing in 2 h
The fetal membranes are expelled within 3 h of foaling	<ul style="list-style-type: none"> • Fetal membranes are still retained or incompletely expelled by 3 h
Discomfort may continue for a few hours. A reddish odorless mucoid discharge continues for up to 6 days.	<ul style="list-style-type: none"> • Vulvar discharge is hemorrhagic, brown or malodorous • The mare becomes inappetent, weak, depressed, lame or colicky

Foaling does not end with expulsion of the foal. The fetal membranes or placenta also need to be expelled. During this last stage, visible straining stops. However, uterine contractions continue to ensure that the fetal membranes become completely detached and are expelled. Due to presence of uterine contractions, mares can show signs of colic and discomfort during this stage, which lasts on average 60 minutes, with a range of 15 minutes to 3 hours. If the fetal membranes are not expelled within 3 hours they are considered retained and a veterinarian must be contacted immediately. Retained fetal membranes in mares is an emergency and can have fatal complications, such as septicemia, endotoxemia and laminitis. If a post-partum mare develops inappetence, depression, colic or lameness, or if she has a malodorous, brown or hemorrhagic vulvar discharge, a veterinarian must be contacted immediately.

A new journey begins

With birth of your foal, one part of the journey concludes and a new phase in your foal's life begins with new challenges and gratifications. Most foalings proceed uneventfully. If complications arise, early identification of problems and timely intervention can make a difference in the outcome. In the end, your investment will hopefully go through this important phase safely and your hard work will pay off.

