EXTENSION

AFS-3985

# Foaling Management and Care of the Nursing Foal

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Horse producers face many decisions that require an understanding of the foaling process and the needs of newborn foals.

## Parturition in the Mare

### Gestation Length

The normal gestation length of mares ranges from 320 to 380 days with an average of 338 to 345 days. Gestation length varies between mares and even the same mare from year to year. Gestation lengths shorter than 320 days generally are considered premature and there is an expected need for veterinarian neonatal care procedures. Seasonal factors can impact gestational length. Mares foaling during long day lengths typically tend to have a shortened gestation, while mares foaling during shorter days have a longer gestation. All fetuses are not necessarily mature 320 days from the last breeding. As such, gestational length alone is not an adequate means of determining fetal readiness for birth.

Gestation lengths as long as 365 are not entirely uncommon; however, longer gestations may be a sign of impending foaling problems. For instance, extended gestation length is one of the problems associated with mares consuming endophyte-infected fescue hay or pasture.

### Predicting Day of Foaling

The accuracy of breeding records leads to increased accuracy in predicted foaling dates. A predictor of 335 days (11 months) after the last breeding date is used frequently. The 335 days is actually shorter than the expected average, and as such, will allow for an increased watch before most mares will foal.

There are several conformational changes that indicate a mare is approaching the day of parturition (Table 1). These signs are variable between mares and will change with successive pregnancies. Mammary development and colostrum production in the mare are reliable indicators of fetal maturity and readiness for birth. The calcium concentration of mammary secretions in a majority of mares will increase significantly 1 or 2 days before foaling. Mares with mammary secretion of calcium concentrations greater than 200 parts per million have a 54% probability of foaling within 24 hours, 84% probability of foaling within 48 hours and 97% probability of foaling within 72 hours. Most mares foal within a short period of time if the mammary secretion calcium increases to levels between 300 and 500 parts per million. Mares with mammary secretion calcium levels lower than 200 parts per millionhave a less than 1% chance of foaling within 24 hours of testing. This response can be quantified with testing kits developed specifically for mare's milk, which are available through veterinarians. Water hardness test strips have also been used.

### Preparing the Mare for Foaling

Recommended procedures to prepare a mare to foal vary. Mares on rangeland will foal without any human intervention. Conversely, intensive monitoring and assistance are routine at neonatal clinics for newborn foals at major equine hospitals, and farms specializing in critical care of foals have foaling teams and special facilities. The vast majority of mares receive some type of preparation between these two extremes.

If not housed on the farm where she will foal, the mare should be moved to the location one month prior to the expected foaling date and isolated from resident mares. This will allow the mare to become accustomed to her new surroundings and develop location specific disease immunity before the stress of foaling. The foaling location should provide protection, natural

or otherwise, from wet, cold weather and predators. Foaling mares are housed separately from other horses. Mares should be moved into foaling areas within several days to a week before the expected foaling day. If the mare does not foal within 2 to 3 days after being placed in a foaling stall, she should be walked daily to keep her muscles toned and prevent fluid buildup along the limbs and abdomen.

Mares pastured with access to fungus-infected fescue or fed fungus-infected fescue hay should have all fescue access removed 45 to 60 days prior to foaling. Mares with continued access will have a significant chance of prolonged gestation, low milk production and foaling problems. Drug therapies for prevention and treatment of fescue toxicosis are available from veterinarians.

Foaling paddocks, foaling sheds and foaling stalls have been used successfully. The covered areas in paddocks or stalls should provide a minimum of 200 square feet space for normally sized stock horses, although larger areas are preferred (16' X 16', 20' X 20'). Clean, large particle bedding such as green grass in paddocks or straw in stalls is desirable. Smaller particle bedding such as shavings may collect along the newborn's nostrils. Cleanliness of the foaling area reduces mare and foal disease, so complete stripping of bedding material between foalings and use of disinfectants and cleaners approved by the attending veterinarian are essential. This is an increased need as compared to standard cleaning practices on-farm.

**Table 1.** Changes in Mares Suggesting Approaching Foaling Day.*

| Sign | Usual Occurance |
|---|---|
| | |
| Udder fills: maiden mares may not exhibit; may have partial filling and regression periodically through last trimester. | 2 to 4 weeks prior |
| Change in conformation: tailhead musculature relaxes; abdominal area drops down. | 1 week to 1 month prior |
| Teats fill with milk: variable response. | 2 days to 1 week prior |
| Dripping of milk: variable response. | 1 day to 1 week prior |
| Waxing: secretions form wax-like beads on end of teats a yellowish, honey-like secretion (colostrum). | 1 to 4 days prior |
| Changes in milk mineral content: calcium concentration increases. | 1 ½ to 1 day prior |
| External genitalia relax: musculature under tailhead relaxes, becomes soft and loose. | ½ to 1 day prior |

* Not all signs are seen in all mares and signs will differ in intensity and occurrence from maiden pregnancy to those following previous births.

The general preparation of the mare, excluding vaccinations and standard health practices as recommended by the veterinarian, includes cleaning the mare's body, washing the perineal and mammary gland areas, and wrapping the upper half of the tail. If the mare has had a Caslicks procedure performed in the past, it must be opened before she foals, preferably approaching or at the time she enters the foaling stall.

Consult your veterinarian if a mare appears to be leaking an excessive amount of milk prior to birth, as it may be a sign of an impending abortion. Generally, this pre-foaling milk is not typically colostrum-rich. However, depending on your veterinarian's recommendation, the mare may be milked and the colostrum frozen to give to the foal shortly after birth. Without it, the foal is at an increased risk of infections. This early milk can be tested to determine whether or not it is rich in antibodies. Foals not receiving adequate transfer of antibodies from colostrum at birth may need veterinarian prescribed plasma transfers to boost their immunity. Therefore, it is important to locate a back-up supply for orphan foals or mares without an adequate supply of colostrum.

## Health Programs for the Foaling Mare

Recommendations for which vaccines are needed and frequency of administration are influenced by factors such as geographical location and number of animals routinely arriving and departing from the farm. Owners must consult with their local

veterinarian to develop vaccination schedules that will incorporate all the vaccines needed and administration times that will best maintain immunity for their specific operation. Recommended vaccinations typically include tetanus toxoid, encephalomyelitis, West Nile Virus, Influenza, Rhinopneumonitis, and possibly, Strangles and Rotavirus A. Several of these vaccines require multiple doses. The timing of vaccination is important as late gestation vaccinations will aid in the transfer of protection to the foal via the mare's milk. Schedules to administer vaccinations should be developed with your attending veterinarian's advice.

Recommendations on the types and administration of deworming drugs will also vary because of factors such as geographical location and stocking densities. Consult your veterinarian for the specific needs before starting a deworming program for pregnant mares. In general, deworming is recommendable every 2 to 3 months during pregnancy. Most anthelmintics are safe to use in pregnant mares but be sure to read product labels! For example, organophosphates should not be used in late gestation and it may be prudent to avoid their use at all during pregnancy. Deworming the mare 1 to 2 days after foaling reduces the likelihood of transmission of Strongyloides westeri through the milk.

### Foaling Process

Mare behavior will gradually change during the weeks preceding foaling. They usually show signs that they will soon go into labor. The timetable though is far from being absolute. Some mares may show all the signs, while others may show just a few and will be in labor before you expect it.

### Three Stages of Labor

Stage one begins with the onset of contractions and generally lasts 1 to 2 hours. During this time, the mare becomes anxious and restless. She may appear to be colicky. She may kick at her belly, pace, lie down and get up, look or bite at her flanks, and sweat. She may frequently raise her tail and urinate. Generally, this is the first stage of labor. However, be aware that colic remains a possibility. Contact your veterinarian if such behavior is prolonged for more than an hour or two without progress towards foaling.

Mares may exhibit some of these signs periodically for several days before they actually progress into the foaling process. Most mares will foal at night and prefer, if not require, a quiet, dark place to foal without disruptions. Even though it is advised by most veterinarians to keep a frequent watch on mares approaching the foaling time, disruptions can delay the onset of this stage of labor. Watch systems that emphasize a quiet, dark, uninterrupted environment will help the mare.

During this phase of labor, contractions move the foal through the cervix and into position in the birth canal. The fetal membranes, Chorioallantois, may become visible at the mare's vulva. Stage one ends when the amniotic sac breaks, which is signaled by a rush of fluid.

Stage two is the actual expulsion of the foal. This phase moves relatively quickly and usually occurs within 15 to 20 minutes after the mare's "water breaks." Taking more than 30 minutes to deliver may indicate a need for intervention from qualified attendants. If labor seems to be progressing, wait and watch. Even in a normal delivery, the mare may stand up, lie down and roll several times in an effort to properly position the foal for delivery.

Normal presentation of the foal resembles a diving position, the front feet first, one slightly ahead of the other, hooves down, followed closely by the nose, head, neck, shoulders and hindquarters. If you notice hoof soles up, the foal may be backwards or upside down and you should call your veterinarian immediately. It is important that the presentation of the foal is correct, and that qualified assistance be provided if delivery presentation is abnormal. The mare will remain lying down for several minutes following foaling.

Stage three labor begins after delivery and is the phase during which the afterbirth, placenta, is expelled. Most placentas are passed within 1 to 3 hours after the foal is delivered. Call your veterinarian if the placenta has not passed within 3 hours. A retained placenta can cause serious problems, including massive infection and laminitis. A knowledgeable person should inspect the placenta to insure it was completely expelled and to check for other abnormalities that indicate a potential problem with the foal.

## The Foal

### The Newborn

The mare and foal will remain lying down for several minutes following foaling. The umbilical cord is usually still intact and blood continues to flow from the mare to the foal. The foal will move its head and body within minutes after birth. The umbilical cord should break as a result of this movement. If the umbilical cord is not broken within a few minutes after birth and has stopped pulsing, it may need to be broken by hand. The cord should break at a site approximately one inch from the foal's abdomen, where the cord's diameter is slightly narrower than the remainder of the cord. If it is necessary to manually separate the cord, it should be held firmly on either side of the intended break site, then twisted and pulled to separate. Never cut the cord, as twisting and pulling of the cord stimulate closure of the umbilical vessels and reduce the likelihood of bleeding from the cord stump. If bleeding persists following cord separation, pressure can be applied to the stump for several minutes by squeezing with a thumb and finger.

Foals should make attempts to rise within 30 minutes after birth. Nursing should occur soon after standing, usually within half an hour to an hour and a half. Nursing is important, as the first milk contains antibodies that develop the foal's immune system. If the foal has not nursed within 3 hours, the foal may be weak and in need of assistance or medical attention. Delayed nursing past 8 to 12 hours after birth impairs the transfer of antibodies from the mare to the foal, which puts the foal at risk of not being able to ward off infections. The foal's serum can be tested at 12 to 24 hours of age to evaluate IgG antibody levels. Treatments for low antibody levels include administration of colostrum, plasma immune products and plasma transfers.

The meconium or "first feces" should be passed within the first 8 to 12 hours after birth. Most foals will also urinate within the first several hours of birth. The foal will lie down frequently the first several hours after birth and will sleep for short periods of time.

Recommendations for assisting the newborn foal vary; however, most veterinarians suggest avoiding help unless necessary for the health of the mare or foal. The decision to assist should be guided from an experienced individual, and a qualified person should conduct the assistance. Too much or unnecessary assistance may increase stress in the mare or foal, may be counterproductive to the health of the mare or foal, and as mares are naturally protective, can be dangerous. Several checks are routine to assist decisions on intervention.

After birth, the foal's nostrils may be covered with part of the placenta or bedding. These materials need removing if they constrict respiration. If the foal appears to not be breathing, respiratory assistance will be needed to inflate the lungs. The umbilical stump is treated with disinfectant, such as tame 2% iodine solution or 0.5% chlorhexidine (Nolvasan) diluted 1 to 4 parts water shortly after it is broken. The umbilical stump should be treated once or twice daily for the first couple of days. Unless there is infection, the umbilical stump should dry up within one or two days after birth. The expected foal behavior post foaling is listed in Table 2.

The foal should have an examination within 12 to 24 hours after it is born. Procedures include an ophthalmic exam, respiratory exam, and visual checks for conformational abnormalities. As mentioned above, the foal's antibody levels in the serum should be tested for IgG antibodies, which should be above 800 milligrams per deciliter.

Early life handling of foals has benefits of imprinting acceptable behaviors around people. There are several publications on the timing and routines of imprinting. These sessions begin immediately after birth.

Foals and mares should be allowed access to paddocks or pasture within a couple of days post foaling. If weather and facility constrain access to paddocks, mares should be hand walked with the foals by their sides. Mares and foals should be turned into pastures or paddocks with other lactating mares within several days to a week after foaling.

## The Nursing Foal

Foals receive their nutrition from the mare's milk exclusively for the first several weeks to one month of age. If allowed access to their dam's grain or grain by creep feeding, foals will begin to eat small amounts of grain rations within the first month of their life. Creep feeding provides supplemental feed to foals by using feeders constructed to restrict access of mares.

Vaccination and deworming schedules should be under the supervision of your attending veterinarian. The time to begin

**Table 2.** Normal Post-Birth Parameters for Newborn Foals.

| Parameter | Average Time Post Foaling |
|---|---|
| | |
| Suckling reflex | Develop suckling reflex within 2 to 20 minutes; test by placing index finger inmouth. |
| Sternal recumbency | 1 to 2 minutes. |
| Time to stand | 60 minutes; if foal takes over 2 hours to stand then problems might be present that need immediate attention. |
| Time to nurse | 2 hours; abnormal if foal takes over 3 to 4 hours. |
| Temperature | 37.2 to 38.6o C or 99 to 101.5o F in non-stressed birth. |
| Heart rate | Greater than 60 beats per minute (bpm) at 1 to 5 minutes post foaling; 80 to 130 bpm at 6 to 60 minutes post foaling; 80 to 120 bpm at 1 to 5 days post foaling. |
| Respiration rate | 60 to 80 breaths per minute first 30 minutes; 30 to 40 breaths per minute at 1 to 12 hours after foaling. |

vaccinations depends on the vaccination of the mare prior to foaling. Vaccinations given to mares the last 30 days of pregnancy will assist the protection of the foal during the first several months of life. In general, foals born to mares with current vaccinations should receive their first vaccinations at 6 to 9 months of age as vaccinations at an earlier age may interfere with the foal's immune response resulting from the antibodies received in the mare's milk. If mares are not vaccinated before foaling, foals should receive their vaccinations beginning at 3 to 4 months of age. Owners should consult with their veterinarian to refine timing of vaccinations.

## Orphan Foals

Orphan foals will require milk replacement. There are several commercially developed milk replacers. Preplanning for the potential need by locating suppliers before foaling will help access a supply in an emergency. Foals can be taught to drink in buckets. Holding the bucket with milk replacer near the foal, with milk on the person's fingers, can encourage the foal to begin drinking the milk. The majority of foals will drink readily from the bucket after two or three offerings. Bucket placement at the level of the foal's chest will help access. Buckets that are left for the foal to drink need to be securely attached to the stall wall. The first several feedings may require handlers to hold the bucket and/or foal. Foals drink small amounts frequently, so a small, continual supply of fresh replacer will be required. Buckets will require cleaning to remove any left over residue or milk. Most label directions suggest free choice supplies of replacement, as the foal will regulate needs. Milk replacer pellets, also called foal pellets, are also an option. Additionally, the use of a nurse mare may be an option if a suitably mannered mare in early lactation is available.

A soft, pelleted or extruded grain source should be offered to the orphan within several weeks following birth. Depending on consumption patterns of grain, foals may be weaned off milk replacer around two months of age. Housing around other horses will help reduce stress in orphans. Placement of a companion animal, such as a small goat, with an orphan has been used successively to further reduce stress in orphans. Management of orphans should encourage moving foals into normal management and contact with other foals as quickly as possible. Contact with other foals increases the desire to consume feed and provides the orphan a companion to reduce stress. Once over 2 to 3 months of age, most orphans can be placed with other foals going through the weaning process.

## Weaning

Foals are typically allowed to nurse their dams until 4 to 5 months of age. By that time, the foal should consume substantial amounts of feed and are mature enough for weaning. Weaning methods vary from abrupt removal of the dam from the foal's location to more gradual separation methods. The gradual separation method removes the foal from all physical contact that allows nursing but allows the foal to be housed next to the mare and see, smell and hear its dam. Adjoining pens or stalls are used to allow for visual contact but are constructed with fencing that restricts nursing. After several days of side-by-side housing, mares are removed completely from the foals. Proponents of gradual methods site research that shows reduced foal stress when allowed visual and auditory access to dams housed in adjoining enclosures. Weaning enclosures should be free from projections that increase the chance of injury. Regardless of method, foals weaned in pairs will have reduced stress. Those with a single foal to wean have successfully used other companion animals such as a goat to provide companionship of the foal being weaned. Once weaned, foals should be housed in paddocks or pens with other weanlings.

Peer Reviewed

**Reed Holyoak**
Professor, Department of Veterinary Clinical Sciences

**Kris Hiney**
Associate Professor, Department of Animal and Food Sciences

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