

Are You My Mother?: Maternal Behavior

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Anyone who has witnessed a foal's first few minutes in this world might agree that one of the most miraculous parts of the process is the way a mare greets and bonds with her newborn. With a deep sniff at the baby's nostrils, that distinctive deep "chuckling" nicker (answered by the foal's higher-pitched response), and some broad strokes of her tongue on the wet hide, a new mother seems to recognize the foal not only as something she needs to nurture, but as something uniquely hers--even if she has never given birth before.

What triggers maternal behavior? What factors might influence the strength of the bond between mare and foal? Animal behaviorists have studied the mare/foal dynamic in considerable detail, so there's lots we *do* know about the process, but there are a few lingering mysteries, too.

What's Normal?

Sue McDonnell, PhD, a Certified Applied Animal Behaviorist, is the founding head of the Equine Behavior Program at the University of Pennsylvania School of Veterinary Medicine. She notes that there should be four distinct qualities in a new mother's behavior. She should accept her foal, respond to it, interact with it, and facilitate its standing and nursing.

"Many animals prepare a birth site before they give birth, but horses don't really do this," McDonnell notes. "A mare will usually just find a quiet spot a little removed from the herd. She will, however, interact with her foal very early--sometimes even before he's fully expelled. The interaction takes the form of nickering, nuzzling the foal, and oral/nasal contact (the 'breathing into each other's nostrils' ritual horses use to greet each other--in essence, the mare is 'meeting' her foal for the first time)."

The next stage, licking her foal dry, usually occurs as soon as the mare gets to her feet after foaling. She'll concentrate first on the fetal membranes around the foal's head, then move on to the hindquarters and the perianal area (oddly, in many animals, stimulating the anal area of a newborn seems to kickstart the sucking reflex needed for nursing). Only later will she move on to washing the foal's midsection. This licking behavior usually lasts only an hour or two after birth, although there are exceptions.

At some point within a couple of hours of giving birth, the mare should also pass the placenta; but unlike many species, it's very unusual for her to eat it. In one survey of owners, only 1% of mares were observed to eat the placenta--which is just as well, because it could obstruct the gastrointestinal tract near the cecum and trigger a case of colic.

As the foal makes his first attempts to get to his feet, the mare will attempt to encourage him to nurse by nudging his hindquarters (again, probably more to stimulate the anus than to "steer" him in the direction of her udder). She'll also show a marked tendency to keep her body between the foal and any perceived threats, including herdmates and her owners--which is why it's so difficult to get a good photograph of a newborn foal!

Some mares will display uncharacteristic aggression toward humans or horses who invade her space at this time.

"This response is triggered by parturition (foaling)," McDonnell says, "and usually wanes within the first 48 hours." First-time breeders should keep in mind that even the most mild-mannered mare might make this transformation when she has a new foal; it's worth being cautious when you approach.

Maternal behavior appears to be instinctive, and probably is jumpstarted by the release of hormones during parturition. Oxytocin is one of the main players in this hormonal flux, but there are several other "background hormones" at work as well. In some other species, a shot of oxytocin can stimulate maternal behavior in an animal which shows some ambivalence toward her offspring, McDonnell says. But in horses it's not that simple--which should come as no surprise to most breeders!

The hormones released during parturition stimulate the mare to want to mother *something*, she adds, "and the foal is the first thing to come along. Later, olfactory signals serve as an identification tag for the particular foal which is hers, but initially, almost anything will do."

Are You My Mom?

Surprisingly, the process of the mare recognizing the foal as uniquely hers--a behavior called selective bonding--isn't instantaneous. Instead, it seems to evolve and strengthen over a period of about two to three days. It's based mostly on olfactory recognition, and it's likely the vomeronasal organ (the "secondary" scenting mechanism horses use in pheromone identification and sexual behavior) that is used to help the mare memorize the special scent of her baby.

"In the first 24 to 36 hours after birth," McDonnell explains, "she's not as locked in to her foal, and is more likely to accept another foal as hers. Somewhere between day two and day three, she'll complete the bond with her particular foal and after that, will reject 'alien' foals."

Maternal behavior in the first few weeks of a foal's life includes maintaining close contact with the baby to protect him from danger. At first, the mare will keep herself within about six feet of the foal at all times. When the foal stretches out to sleep (which he'll do frequently in the first few weeks of his life), the mare generally will stop grazing and stand on guard over his prone form. As he gets older, she might continue to graze as he snoozes, but always in close proximity, and generally in a circular pattern around the foal (as opposed to the straight trajectory she'll usually adopt when the foal is awake and active).

Interestingly, in herds of wild or feral horses, the duties of parenting might be shared by the stallion.

"In natural conditions, the stallion is quite interactive," McDonnell says. "He'll nicker at the foal, guard the foal when the mare is down, play with it, and herd it back into the group if it wanders off too far--especially in the first two to three weeks of the foal's life. The mother chiefly provides nursing to her baby."

In most domestic situations, of course, stallions don't get the opportunity to be parental, as they're almost invariably segregated from the herd. But in a group of broodmares and foals, you might observe a certain amount of shared parenting, particularly among experienced mares.

"The rest of the band often finds a new foal quite attractive," says McDonnell, "although mares may or may not allow others near in the first 24 to 36 hours."

The tendency of mares to place themselves between their foals and any perceived threat can sometimes be a problem in a domestic situation. In close confinement, such as a stall, it can sometimes result in a foal being inadvertently stepped on or run over as the mare rushes to position herself in front of her baby. In fact, many instances of mares injuring their foals can be avoided if the two are living in a large open space, such as a big paddock rather than in a small one (more on this in a minute). In the wild, of course, foals have plenty of room to get out of their mothers' way, so they rarely suffer injury from the overzealous protective instincts.

The distance the mare will allow between herself and her foal increases as he matures. The foal plays a part in this interaction as well; bolder personalities will test the limits early on, while "shrinking violet" types will prefer to stay close to mother's side. (These early tendencies can tell a breeder a great deal about the personality of each foal.)

When Things Go Wrong

Horses, as a rule, are excellent parents to their offspring, but inadequate or abnormal mothering behavior *does* occur in mares, albeit rarely. (McDonnell estimates the incidence of problems at less than 5%.) The causes are poorly understood, although we know they're more common among first-time mothers, that there *might* be a genetic predisposition among certain bloodlines, and that mares which prove to be poor mothers the first time around often repeat the behavior with subsequent babies.

Abnormal maternal behavior usually surfaces immediately after birth, although in a few cases it might become evident after one or several days of apparently normal acceptance and nurturing of the foal. Here are some of the behaviors to watch out for:

A) Ambivalence--This is an absence of bonding and protective behavior and attention to the foal. The mare just doesn't seem interested in the new arrival. "She doesn't engage in that early 'cross-talk' with the foal," explains McDonnell. It often occurs when the mare (and/or the foal) is sick, weak, or medicated. For instance, a mare might have had a difficult birth (dystocia) or the foal had to be delivered by cesarean section. In those cases, normal maternal behavior might return as the strength of the compromised individual returns. Sometimes, too, bonding behavior between the mare and foal is interrupted when they are separated or there is interference immediately after birth (as occasionally happens when owners try to "imprint" foals).

B) Extreme protectiveness--Some mares become aggressively protective of their foals to the point of being dangerous to handle, and potentially dangerous to their babies. While rushing to get herself between her foal and any perceived threat (from an owner, veterinarian, or even the barn cat), such a mare might crush her foal against a man-made object such as a stall wall, or trample him. This behavior often is misinterpreted as a deliberate attack on the foal. The intensity of overprotective behavior usually wanes after a few days, but in some cases, it persists until the foal is weaned.

C) Fear of the foal--Some mares, particularly first-time mothers, seem genuinely afraid of their foals. They don't appear to recognize them as horses, much less "theirs," and instead of approaching and bonding, they're intent on getting away from the new "foreign object" in the stall. Many of these mares can be acclimated to the foal's presence, as they would any other strange object, but they never really bond with them.

D) Avoidance of nursing--This probably is the most common form of aberrant maternal behavior. It really isn't a rejection of the foal, but just a reluctance to have him nurse. The cause is pretty easy to discern--some mares are very touchy about their udders, especially when there's edema present and the milk glands are swollen and full for the first time.

"Nursing avoidance is largely preventable," says McDonnell. "It's worth getting the mare used to having her udder touched and handled before she foals. If she gets really swollen, you may even want to milk her to relieve the pressure. Save the colostrum (the antibody-rich first milk present in the udder only in the hours right after birth), then let the foal suck, and give him the colostrum by bottle afterward." (For more information on colostrum collection see page 106.)

E) Foal stealing--This is a rare, but intriguing, maternal behavior problem, in which an expectant mare (usually one within a day or two of foaling) tries to adopt or "steal" the foal of another mare. Once she has her own foal, she usually loses interest in the stolen baby, but at that point, he might not be re-accepted by his original dam (which might have passed the optimal "window" for strong bonding).

"This behavior usually only occurs in situations of tight confinement with large herds," McDonnell observes.

F) True foal rejection--This is the rarest manifestation of abnormal maternal behavior, but it's also by far the most serious. When a mare turns her aggression toward her foal, the situation is truly life-threatening for him. She might savagely attack him, biting or grabbing him by the neck or withers and lifting or tossing him against a fence or wall. She also might pin him to the ground and stomp on him repeatedly.

Savage behavior often follows one or more days of apparently normal acceptance, bonding, and protection of the foal, and no one really knows what sets it off. It can be distinguished from accidental injury, though, by the pattern of attack.

"If the foal has a bite mark on the crest of his neck, you can almost guarantee that it won't be a one-time incident," McDonnell says.

"We don't understand what triggers these episodes, but we know they're very likely to repeat. It can sometimes be associated with feeding aggression, but we don't see enough of this behavior to really become authorities on it."

Solutions

So what can you do to help steer an abnormal mare/foal interaction in a more conventional, healthy direction? Sometimes it's a matter of quick intervention--and other times, it's more about getting out of the way.

"A lot of problems result from too much commotion and too small a confined space," McDonnell says. "If a mare has space to move around, she can get away without trampling her foal, and the foal is far less likely to be injured or killed. If they're in the open, the owner can observe and figure out what's truly going on between the two, whether it's overprotectiveness, fear, or true aggression.

"An ambivalent mare can often be stimulated into more normal maternal behavior by her foal, who'll stimulate 'retrieval behavior' in her when he wanders off," she adds. "Even a sick or weak mare will usually gather all her strength to retrieve the foal and bond with him. If she doesn't respond right away, the foal will keep trying for up to about three to five days, attempting to get her to recognize and protect him."

Overprotective mares can benefit from more space as well. In a large paddock, she'll feel less "trapped," and her foal will have room to scramble out of the way when she crowds him. The overprotective mare also should be conditioned gradually to accept the presence of "intruders" near her foal, not only because she will need to be handled, but also because her foal will benefit from gentle daily interaction with humans at this impressionable age. A bucket of grain can be a powerful persuader for such a mare, but you'll need to remain cautious around her until you're sure she's truly relaxed and accepts you.

That said, there is such a thing as too much intervention.

"Management style seems to have a lot to do with the incidence of abnormal maternal behavior," says McDonnell. "Close confinement and too much human interference seems to increase the risk. For instance, in North America, Arabian breeders report a higher incidence of foal rejection than other breeds (in one survey of 135 reported cases of rejection, 52% were Arabian mares)." McDonnell notes that when she has worked with Arabians on Polish stud farms, which favor a much more "open" management style, she has observed very few rejection problems. "I think there may be some merit to the idea of going back to letting mares foal in the open," she says. "It's certainly important not to go overboard in terms of intervention.

"For instance, I'm very conflicted about the idea of foal 'imprinting.' There's very little evidence that there's some special window of opportunity for humans to bond with foals, and the imprinting process often results in a foal who's very people-oriented--to the point of being a pest--and has a relatively weak bond with his dam."

One case where intervention is necessary is when the mare won't allow her baby to nurse. In that instance, she needs to be put in a nursing chute (a narrow stall with an opening at udder height that allows the foal to reach in and suck without being kicked or chased away) or otherwise confined. Even a bale of hay or bag of shavings, placed between her forelegs and hindlegs, can help keep the mare from cow-kicking or squatting down to prevent nursing. She can be distracted with a small bucket of feed or a haynet while the foal drinks.

"Fortunately, foals are pretty clever at positioning themselves to suck and get away," McDonnell observes.

Tranquilization of a mare who is having trouble accepting her new role as a mother would seem a logical approach. However, great care in selection of the drug and the dose used is critical. The commonly used acepromazine will pass to the foal with the milk, and young foals can be seriously depressed by it. Other drugs, such as xylazine or detomidine, probably don't persist in the mare long enough to be of great help. Be sure to discuss this concept thoroughly with your veterinarian before you proceed.

Some mares gradually will come to accept having their foals nurse after a few sessions with confinement and/or tranquilization, and eventually can be turned loose with their foals in the normal manner. Others never come to terms with it, and either must be confined at regular intervals so their foals can nurse, or should be separated from their babies to minimize the risk of injury. The foal essentially becomes an orphan at that point, and you have the option of finding him a nurse mare or feeding him by bottle until he's ready to be weaned.

Keep in mind that a mare's behavior might not be the same from one baby to the next.

"I've had mares who were lackadaisical about their first foal, then fiercely overprotective with subsequent foals," says McDonnell. "Fortunately, most older broodmares eventually get very sensible. A mare who's fearful of her first foal doesn't usually repeat the behavior, but mares who truly reject their foals are at a very high risk of repeating the behavior, and probably should not be bred again."

When a mare savages her foal, "the relationship should be considered *over* for the health of the foal," McDonnell says. "Before you decide your mare is truly trying to hurt her foal, make sure she isn't charging at you, or the farm dog, or something else. But once you determine she has savage intent, you need to separate them permanently. If you can, have a nurse mare lined up."

Fortunately, many less-than-perfect mare/foal relationships can be salvaged. As long as the foal isn't in physical danger, it's worth trying, at least for a few days. McDonnell suggests that you do the following:

- Make sure the foal gets some milk (and colostrum!) into his system so he has energy and antibodies to keep his strength up.
- Get the mare and foal out into a large paddock, where the foal can move far enough away to stimulate retrieval behavior in the mare.
- Don't handle the foal more than absolutely necessary--you don't want to confuse his distinctive odors with yours.
- Try repeating the olfactory triggers for the mare by rubbing the fetal membranes on the foal, or even putting a bit of his meconium (his sticky first manure) on his body.
- Avoid switching to an artificial milk source for as long as possible--some researchers feel that it can change the odor of the foal's manure, which might be an olfactory trigger for the mare. If possible, keep milking the mare and offering it to the foal by bottle or bucket.
- Consider the use of tranquilizers to facilitate nursing.
- Once you decide to make the transition to a nurse mare, do it; don't wait until the foal is too weak from hunger to nurse.

With any luck, you'll never have to face any of these abnormal behaviors; all of your mares will be excellent moms, and all of your foals will grow up straight, strong, and well-adjusted. The odds certainly are in your favor. Here's to a season of uncomplicated foaling and healthy bonding--and being prepared for the unexpected.

**Readers are cautioned to seek the advice of a qualified veterinarian
before proceeding with any diagnosis, treatment, or therapy.**



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