

# Mare and Foal Behavior

Sue M. McDonnell, MA, PhD

Inadequate maternal behavior of mares and mare and foal bonding problems are rare in natural social environments. Management that best accommodates natural behavior can help avoid or overcome problems in domestically managed horses. Author's address: University of Pennsylvania School of Veterinary Medicine, New Bolton Center, 382 West Street Road, Kennett Square, PA 19348; e-mail: suemcd@vet.upenn.edu. © 2012 AAEP.

## 1. Introduction

A basic understanding of normal and problem mare and foal behavior under natural and domestic social conditions can be valuable to the veterinary practitioner for (1) education of clients to manage foaling to best support normal mare and foal bonding and foal development, for (2) providing professional assistance in instances of inadequate or aberrant maternal behavior or mare and foal bonding problems, as well as for (3) advising on common questions concerning normal and abnormal foal behavior during development, early intensive handling, and least-stress weaning of foals.

### Parental Behavior in Horses

Studies of mare and foal behavior under natural social and environmental conditions as observed in various free-roaming and semiferal populations with original references have been summarized elsewhere.<sup>1</sup> In brief, care and protection of the neonate and developing foal involves principally the dam and her harem stallion but also includes some contributions as needed from other adults and even older juveniles within the natal band in the form of assisting with retrieval of a lost or stranded foal or directing a neonate to the dam, should it attempt to nurse a herd mate.

Normal maternal behavior includes attention to fetal fluids and membranes during and immediately after parturition and positive attention to the neonate, including olfactory investigation and Flehmen response, licking, nuzzling, avoiding walking on, keeping intruders from approaching or interacting, allowing and facilitating sucking, and standing guard near or with head and neck over the foal whenever it is recumbent. Attention to the fetal membranes and fluids is common, but ingestion of the afterbirth as is common in some species is rare.<sup>2</sup> Under natural conditions, the strategy of horses for dealing with the predator-attracting birth fluids and membranes is to move away from the birth site as soon as possible. The harem stallion can often be seen encouraging the foal and mare to move on to a fresh site as soon as the foal stands, even before nursing.

The foal's behavior appears to play a role in stimulating the dam's response and vice versa. In its first coordinated movements immediately after birth, even before standing, the foal appears to orient toward the dam, reaching for her head and appearing to seek nose-to-nose contact at first. Upon standing, the foal appears to be instinctively attracted visually to follow horizontal edges at nose height, which in nature is usually only the dam's

---

## NOTES

abdomen. Along with assistance of the dam's reverse parallel orientation to the foal and likely olfactory cues as the foal approaches the udder, this instinctive behavior brings the foal's lips to the flank and udder.

Under domestic management, care of the foal is generally limited to the dam. Detailed descriptions of mare and foal behavior under domestic conditions can be found in publications of Dr. Katherine Houpt<sup>3</sup> and her student Dr. Sharon Crowell-Davis.<sup>4</sup> When isolated or when housed or pastured with unfamiliar horses, some individual dams appear hypervigilant and demonstrative in their role of protection of the neonate, perhaps due to lack of the social support for this role within a band under natural social conditions. In pasture groups of domestically managed horses, the behavior of other mares is typically either ambivalent or positive toward a dam and neonate. Gelding herd mates may show protective behavior of the dam and/or foal, as under natural social conditions a harem stallion would guard and protect his band. Most geldings, like stallions, are especially protective and tolerant of foals.

Mare and foal bonding problems have been detailed in Grogan and McDonnell.<sup>5</sup> Briefly, there are at least six distinct types of problem.

(1) Good maternal protectiveness misunderstood as aggression toward foal. Probably because of the domestic practices of isolation and confinement for foaling, some dams appear especially stressed concerning foal protection and care. When confined in small or "trapping" spaces with poor footing and obstacles, foals can easily be injured by a mare trying to position herself between her foal and a threat. For example, if her hay is fed at the rear of a stall, a dam with strong instantaneous reaction to threats may inadvertently trample or bump a foal into an object in the process of responding to a threat at the front of the stall. Adequate space and facilities with minimal provocation of protective behavior is recommended until protectiveness usually naturally wanes over the period of 3 days to 2 weeks.

(2) Ambivalence. Primiparous mares, as well as weak or painful mares, may have delayed interest and response to the foal. The onset of intensely protective behavior is typically not immediate and may be first seen as late as 18 to 36 hours after parturition. Under natural conditions, other adults, including the harem stallion, appear to assist such dams with protection of the foal and with keeping the foal with the dam. Support of the foal in staying near the dam and supervised nursing is recommended, with typically a good prognosis for onset of adequate to excellent maternal behavior and bonding with the foal within 2 to 5 days.

(3) Fear of the foal. Some mares, almost always primiparous, react to their neonate with fear behavior as some horses may react to species such as swine or camelids, with which they have not been exposed. Positive reinforcement-based systematic acclimation, similar to what is effective in helping

a horse overcome fear of other new objects, procedures, or situations, is recommended, with typically a good prognosis for eventual acceptance of the foal adequate for maintenance of the pair.

(4) Nursing only avoidance or aggression toward foal. Most often this is judged to be due to sensitivity at the flank or udder, sometimes in association with obvious udder discomfort. Relief of udder discomfort and positive reinforcement-based acclimation to touch of the flank and udder as well as supervised nursing or milking and bottle-feeding at the udder are recommended until the foal is accepted.

(5) Savage attack. Just as some stallions intermittently attack people, some mares that show otherwise good maternal behavior, intermittently attack their foal. Attacks can involve biting, kicking, thrashing by the crest of the neck, and stomping in a sustained manner similar to that of a horse killing a small mammal. If the foal survives, the mare typically returns to good maternal behavior and then repeats at some later date. In confirmed cases of savage attack, immediate separation is recommended. It can be expected that the mare may repeat with subsequent foals.

(6) Foal stealing. A near-term pregnant mare may steal a neonate from a weaker mare. When the thief mare foals, she typically abandons the stolen foal in favor of her own. Foal stealing is rarely observed in horses, except under crowded conditions and synchronization of foaling, for example, induced parturition in feed-lot conditions.

#### Orphan Foals

Use of a foster mare is generally considered the best method for meeting the nutritional and behavioral needs of an orphaned foal. Foster mares can include local mares that have recently (within 24 hours) lost a foal or occasionally one that will accept a second foal, open mares hormonally prepared to lactate and to accept foals,<sup>6</sup> and professional "nurse" mares managed by farms with systems of hand-rearing the foals of the nurse mares. If a horse or pony mare is not available, nanny goats typically accept nursing of a foal (Fig. 1), and typically provide better for the nutritional and behavioral needs better than hand-feeding. Most foals can be trained to drink from a bucket or tub (Fig. 2). Training can be accomplished by drawing the foal's muzzle into shallow pail of milk, with a finger or nipple in the foal's mouth. In healthy foals, withholding feedings for several hours before bucket feeding attempts may increase appetite and acceptance. Groups of foals have also been successfully fed using an automatic calf-feeding machine, which provides a constant supply of fresh milk replacer through a nipple mounted on the wall.<sup>7</sup> To avoid behavior problems in hand-reared foals, which can be generally described as overly bonded to people to the extent of sexual response to humans, it is recommended to

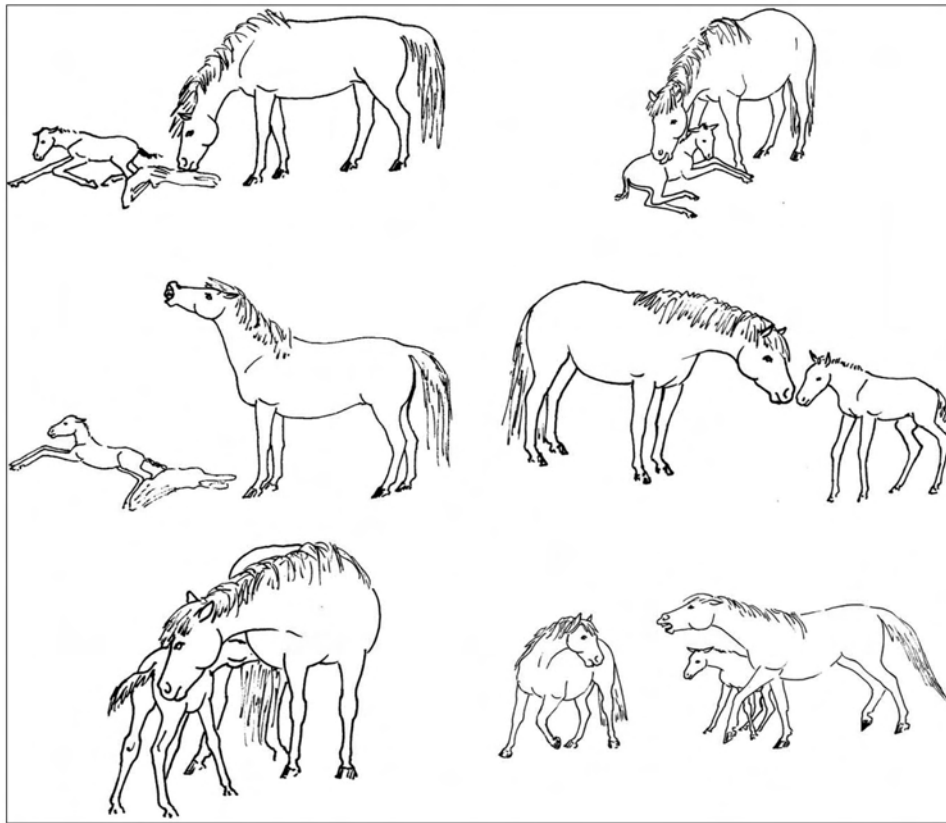


Fig. 1. Key elements of normal early maternal behavior (from McDonnell,<sup>1</sup> *Inadequate Maternal Behavior and Bonding*).

provide as much social interaction with horses (or other animal companions such as donkeys or goats) and as little human contact as possible. Particularly, to the extent possible, feeding should not be done in the presence of people. Therefore bucket-

feeding is far superior to hand-held bottle-feeding. Orphans reared together and bucket-fed in a “kindergarten,” as shown in Fig. 3, typically develop normal behavior. Older foals can be observed performing some of the protection and emotional sup-

FOCUS

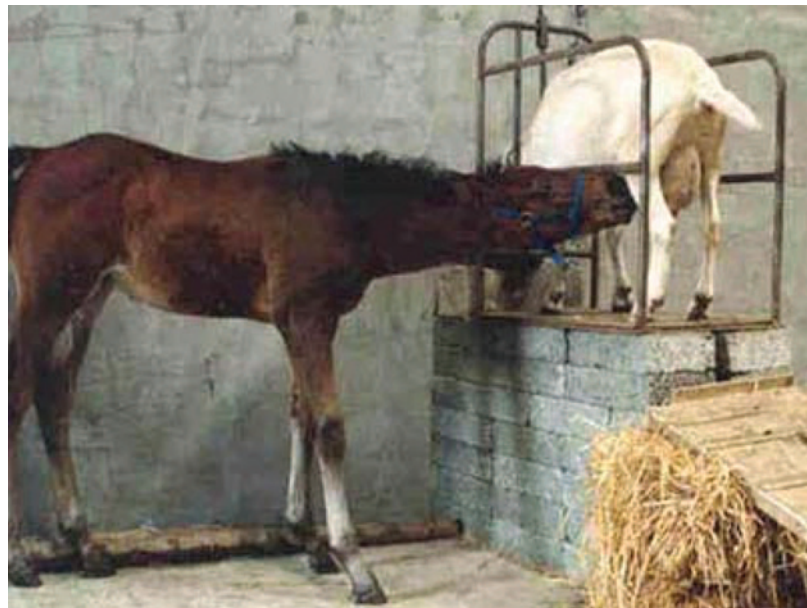


Fig. 2. Nanny goat using inexpensive set-up for nursing a foal. <http://dianabuja.wordpress.com/tag/boer-goat/>. Accessed December 11, 2011.



Fig. 3. Orphan foals feeding from buckets and playing in a commercial kindergarten at Justaplain Farm in Cochranville, Pennsylvania, which has “graduated” eventual stakes race winners. Photo by Elkanah Grogan of the Equine Behavior Lab at New Bolton Center, reprinted with permission from Grogan and McDonnell.<sup>5</sup>

port responses typical of dams. Geldings or open mares without foals in nearby paddocks or within a kindergarten can provide additional social support for orphan foals.

Early Intensive Handling Protocols for Foals

A program of early organized positive handling of foals to introduce them to human contact and basic

handling equipment and techniques, including transport, while they are young, is considered generally to be a wise practice. Considerable debate continues on the best timing and the most efficient and effective procedure with least likelihood of adverse effects due to “technique failures.” In general, the younger and less strong the foal, the easier to safely confine and restrain it for organized and positive introduction to human handling and acclimation to restraint and specific procedures. There is evidence that the foal’s experience as a bystander when its dam is handled in a positive manner can be a positive influence on its own acceptance of human handling (Henry et al<sup>8</sup>).

Normal Early Foal Behavioral Development

Based on observations of both semiferal and domestic foals, Grogan and McDonnell<sup>5</sup> proposed a scoring system for early foal development based on an expanded list of behaviors reflecting early development. Table 1 outlines their neonatal early development (NED) scoring system. Foals born in more natural environments such as at pasture and in semiferal social conditions generally score higher than foals born indoors, isolated from the stimulation of herd mates or on artificial surfaces that obviously delay the ability to stand and move.

Least-Stress Weaning

In recent decades, evidence has accumulated that early or abrupt weaning poses considerable risk to the foal of developing gastric ulcers, losing condition, and showing behavioral signs of stress that together can result in interruption of thriving and in some instances can predispose the foal to life-long behavior problems such as stereotypies and separation anxiety (Waran et al<sup>9</sup>). Current recommendations for least-stress weaning include separation from the dam no younger than 5 or 6 months of age, ensuring that the foal has developed behavioral signs of independence from the dam and social interest in other horses, and ensuring that the foal

Table 1. Neonatal Early Development (NED) Scoring Inventory

Behavior	Slower Than Usual = 0	Average to Low Normal = 0.5	High Normal = 1
Sternal righting	>5 min	3–5 min	<2 min
Shake response (head or body)	>10 min	3–10 min	<3 min
Attempts to stand begin	>30 min	10–30 min	<10 min
Stand successfully (with steps)	>60 min	30–60 min	<20 min
Standing udder-seeking	>10 min	3–10 min	<3 min
Suckle	>90 min	45–90 min	<45 min
Locomotor burst of speed	>2 h	1–2 h	<1 h
Circle dam at speed	>2 h	1.5–2 h	<1.5 h
Organized recumbency	>3 h	2–3 h	<2 h
Autogrooming	>3 h	2–3 h	<2 h
Organized gaits (walk, trot, plus)	>4 h	2–4 h	<2 h
Retreat from approaching human	>4 h	2–4 h	<2 h

From Grogan and McDonnell.<sup>5</sup>

Total score of greater than 10 is high normal, 4 to 6 is average to low normal, and less than 4 is slower than usual.

is nutritionally independent from the dam before weaning. Methods that temporarily separate the foal from access to the udder while allowing direct contact or nearby visual contact with the dam for “emotional” support during moments of stress, typically appear least stressful to the foal. Udder covers or gradual introduction to separation from the dam at increasing distances and durations within sight and with known companions and/or some remaining adult mares is considered less stressful than abrupt permanent separation in isolation from known herd mates or from other horses.

The Equine Behavior Program at New Bolton Center is in its 25th year of support by the Dorothy Russell Havemeyer Foundation.

**References**

1. McDonnell SM. *The Equid Ethogram: A Practical Field Guide to Horse Behavior*. Lexington, KY: Eclipse Press; 2003.
2. Virga V, Houpt KA. Prevalence of placentophagia in horses. *Equine Vet J* 2001;33:208–210.
3. Houpt KA. Equine maternal behavior and its aberrations. In: Houpt KA, editor. *Recent Advances in Companion Animal Behavior Problems*. International Veterinary Information Service, Ithaca NY (www.ivis.org). Last updated November 11, 2011; A0802.1111.
4. Crowell-Davis S, Weeks JL. Maternal behavior and mare-foal interaction. In: Mills D, McDonnell SM. *The Domestic Horse: The Origins, Management and Development of Its Behaviour*. New York: Cambridge University Press; 2005: 126–148.
5. Grogan EH, McDonnell SM. Mare and foal bonding and problems. *Clin Tech Equine Pract* 2005;4:228–237.
6. Daels PF, Bowers-Lepore J. How to induce lactation in a mare and make her adopt an orphan foal: What 5 Years of Experience Have Taught Us. In *Proceedings, Am Assoc Equine Pract* 2007;53:349–353. Ithaca: International Veterinary Information Service (www.ivis.org), 2007; Document No. P8161.1207. Available at www.ivis.org.
7. Glendinning SA. A system of rearing foals on an automatic calf feeding machine. *Equine Vet J* 1974;6:12–16.
8. Henry S, Hemery D, Richard MA, et al. Human-mare relationships and behavior of foals toward humans. *Appl Anim Behav Sci* 2005;93:341–362.
9. Waran NK, Clarke N, Farnworth N. The effects of weaning on the domestic horse (*Equus caballus*). *Appl Anim Behav Sci* 2008;110:42–57.

Orig. Op.	OPERATOR:	Session	PROOF:	PE's:	AA's:	4/Color Figure(s)	ARTNO:
-----------	-----------	---------	--------	-------	-------	-------------------	--------