

Feeding The Orphan Foal

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Every breeder dreads finding himself or herself with an orphan foal--a baby left alone when his dam dies of foaling complications or from a later, unrelated injury or illness; or a foal rejected by his mother or for some reason, unable to nurse. Even a foal which can't derive enough nourishment from nursing his dam (as when she is a poor milk producer), or one prematurely separated from her, can be considered an orphan, because for all intents and purposes, he's going to depend on you for all of his meals.

Orphans tend to be bad news for breeders for two reasons (quite apart from the tragedy of losing a broodmare). First, they are very high maintenance, particularly in their early days, needing attention every two hours or more, and second, there's a perception that orphan foals, no matter how conscientiously you raise them, will always be playing catch-up with their peers, and end up stunted and unable to reach their full height or genetic potential.

There's some truth to the first assumption, but the good news is that there's none at all for the second. Orphan foals, raised with a correct balance of nutrients and monitored for growth, food consumption, and weight gain, can be every bit as tall, strong, and athletic as foals raised by their dams. Studies have repeatedly demonstrated the viability of commercial mare's milk replacers in producing healthy and correct foals--sometimes even champions. Sally Puzacke, director of the equine department at Buckeye Feeds in Dalton, Ohio, notes, "It's possible to raise an orphan to be a completely normal foal from a nutritional standpoint. We've had foals raised as orphans who went on to place in international competitions as weanlings. Some are repeatedly singled out as the best-looking foals on the farm."



ANNE M. EBERHARDT PHOTO

Observe the nurse mare and her new charge closely for a couple of days until acceptance has occurred.

First Things First

If your foal is orphaned at birth, or rejected by his dam (a problem that occurs an estimated 2% of the time, and is most common with first-time mothers), your first consideration is to get him to ingest some colostrum. That all-important first milk will jump-start his immune system through a process called passive transfer of antibodies. A foal can only absorb and utilize colostrum effectively in the first 12 hours of his life, so time is of the essence.

For this reason, it's always wise to be prepared for an emergency by keeping on hand some frozen colostrum, milked from a mare with an abundance of the thick, creamy fluid to spare (or in some cases, from a mare whose foal was stillborn). Colostrum can be collected by the mare owner and stored (after filtering to remove dirt particles) in an ordinary freezer bag, for up to two years. (Freezer bags are ideal because they easily can be labeled with the date, and thawed quickly when immersed in warm water). It's important not to microwave frozen colostrum to thaw it; microwaving will destroy most of the protective antibodies.

You can milk colostrum every two hours from a mare which has had a stillborn foal, until six to 12 hours after foaling. A mare which is supporting a foal usually can afford to donate about 250 ml (a half pint), after her foal nurses. About 16 fluid ounces constitutes a single feeding

for a newborn foal, and most experts recommend that an orphan receive three to four feedings within the first eight hours of his life.

If your breeding operation is a small one, and you've been unable to collect any colostrum yourself, you might be able to purchase some from a large breeding farm, where it undoubtedly will be kept in good supply. You even can arrange emergency shipments through web site services such as www.cyberfoal.com.

Feeding a newborn colostrum usually is a matter of gently warming the milk to equine body temperature and offering it by bottle. Some perseverance is required, as some foals take a while to get the idea. Hunger, however, tends to be a great motivator. If you can't get your foal to nurse, your veterinarian might have to administer the colostrum via stomach tube. To ensure your foal has absorbed sufficient antibodies, you might wish to ask your veterinarian to test his serum IgG levels, a blood test that must be performed when the foal is between six and 10 hours of age. In a pinch, it's possible to use bovine colostrum, which is well-tolerated by foals but provides a shorter-lasting immunity (averaging about nine days instead of the 26 afforded by equine colostrum).

There are a number of commercial colostrum substitutes that can be recommended by your veterinarian if mare's colostrum is unavailable. Make sure and discuss your options with your veterinarian before foaling season, since supplementing foals with compromised or low IgG is time-critical.

Surrogate Moms

After the critical newborn stage has passed, your next task is to arrange some method of regularly feeding the orphan foal. His digestive system is not yet equipped to handle solid food, so some sort of milk or milk substitute needs to be provided--and it needs to be available on a very frequent basis in the first weeks of the foal's life. The lowest-maintenance way to do that is to find a nurse mare which can play surrogate mom to your motherless waif.

For the owner, a nurse mare is the ideal solution. Once such a mare has accepted your orphan as her own, the pair can function as any other mom-and-baby family in your herd until it's time for weaning. Many large breeding farms maintain a few nurse mares, often (although not exclusively) Belgians or Percherons, who not only produce abundant milk, but generally have gentle and forgiving temperaments that make them good surrogates. When such a mare is drafted as a nurse mom, often to a valuable Thoroughbred or Standardbred foal, her own baby in essence becomes an orphan, and is hand-raised or prematurely weaned.

There also are a few farms (largely based in areas where breeding farms abound, such as Florida and Kentucky) that will lease you a nurse mare if you find yourself in need. (See Nurse Mare Directory on page 20 for a sample listing.)

Getting a nurse mare to accept your little stranger as her own offspring sometimes takes a little work. A mare with a full udder often will welcome a hungry foal more readily, and many breeders find it helps to make the foal smell a little more like her, by rubbing his coat with the mare's sweat, milk, or even manure. Alternatively, you can short-circuit the olfactory response on a temporary basis by rubbing a mentholated ointment, such as Vick's Vaporub, in the mare's nostrils and on the foal's head and perianal areas.

Still, you might find that you have to restrain the mare at first until the foal has nursed long enough for her to become familiar with him (usually within 24 hours). Tie the mare in her stall, offer her hay or grain to distract her, and consider placing a bar or pole along her side, at about flank height, from the front to the back of the stall, to prevent her from kicking the foal or her handlers. Some farms even create stocks with solid wooden barriers and a hole cut to allow the foal to nurse, but such steps aren't often necessary. She might initially squeal and threaten to kick or bite the orphaned arrival, but a healthy, hungry foal will not be easily discouraged, and once he manages to latch on, most mares will relax. (Resist the temptation

to tranquilize the mare, however. The drug can be passed in the milk and accidentally sedate the foal, reducing his efforts to nurse.)

Observe the nurse mare and her new charge closely for a few days. Once acceptance has occurred, you gradually can remove the restraints on the mare and let them proceed as Nature intended.

A caution with regard to using draft-breed mares as surrogates; in one study of orphan Thoroughbred foals raised on draft mares vs. foals raised on Thoroughbred mares, the draft-raised babies had faster growth rates (presumably due to the draft mares' higher milk production rates). Those foals also had a slightly higher incidence of developmental orthopedic disease. For that reason, some farms now prefer to use light-horse breeds, such as Appaloosas, for their nurse mares.

Bottle Babies

Because nurse mares are relatively scarce, and can be expensive to lease, a great many farms hand-raise their orphan foals. While this is a valid approach, it often can result in a foal which is more socialized toward humans than to horses. As he grows, his lack of equine social skills can make him a dangerous, spoiled brat. Puzacke notes, however, that it's easy to avoid this syndrome.

"If you want to spoil them, that's your business. But in the studies we've done (in conjunction with The Ohio State University), there was no difference in the socialization with our orphan foals, because we treated them like foals, not like rejects."

Exposure to other horses, and the herd environment, will help an orphan foal develop the same skills as his pasturemates, even if he doesn't have a dam to discipline him.

Hand-feeding is a time-consuming project under any circumstances. During the first week of life, a normal foal can nurse as often as seventeen times an hour. Thereafter, the frequency decreases to about three times an hour, but even that would require a staff of humans to be at the foal's beck and call. With the caveat that the more frequently the foal is fed, the more optimal his growth rate, most orphan foals can be placed on a feeding schedule of once every one to two hours in the first week, then every four to six hours after the second week of life. Within a few weeks of their arrival, most foals will begin to show interest in consuming solid food, which will allow you to taper off the milk feedings as you gradually make the switch to a milk-based pellet formulated for foals. But bear in mind that large, twice-daily feedings tend to cause diarrhea.

How much should a foal drink? At one day of age, his intake should be equal to 10% of his body weight; that figure should be gradually increased to 25% of his body weight at 10 days of age until he is weaned. For example, a 100-pound foal could consume 25 pounds of milk a day, or 50 cups.

Both cow's and goat's milk have been used successfully to feed orphan foals, but neither is an ideal solution. Both are more concentrated than mare's milk; they have about twice the fat, and one-half as much lactose (milk sugar). But both are similar in terms of protein (about 25-27%) and mineral content. Because their lactose content is low, and their fat is highly digestible, they can be used for horses.

But cow's milk, in particular, tends to cause foal diarrhea when fed "whole." It can be made more like mare's milk by diluting it 2:1 with saturated lime water (prepared by adding calcium oxide, or lime, to water until no more of the mineral will dissolve, then letting the mixture stand for several hours and saving the clear water to mix with the milk). Or, try using 2% milk rather than whole (homogenized) milk.

Whether you use 2% or whole milk diluted with lime water, you must add dextrose, a highly

digestible sugar, to the mix. The easiest way to do that is to purchase pectin, a powder that is largely dextrose and used to set jams and jellies. One two-ounce package of pectin is enough for three litres (three quarts) of milk. Or you can add 20 grams per liter (four teaspoons per quart). Don't try to improve the milk's nutrient content by adding corn syrup, honey, or table sugar (sucrose) instead of dextrose. All of these products contain disaccharide sugars, which are poorly utilized by foals and can cause diarrhea or colic.

In some ways, goat's milk is a better solution than cow's milk--its makeup is sufficiently similar to mare's milk that it is often tolerated, unaltered, by foals. If digestive upsets do occur when your foal drinks goat's milk, try the same doctoring you would use on cow's milk--adding lime water and pectin. Impaction can happen when feeding goat's milk, so some breeders recommend adding 30 ml of mineral oil daily to the liquid.

The down-side of goat's milk is that it is usually several times pricier than cow's milk, and can be difficult to find in large quantities. Often cheaper than buying the milk is borrowing a nanny goat, which can be trained to allow a foal to nurse while she stands on a platform of straw bales. Goats also make good companions to foals, but as the foal grows, it might take more than one goat to supply all of his nutritional needs.

Then there are the commercial mare's milk replacers. There are several brands on the market that mimic to varying degrees the protein, fat, carbohydrate, and mineral content of real mare's milk. Most come in a powdered form and are rehydrated with water. Foals generally do very well on milk replacers, with growth rates similar to foals raised on their dams (the growth rate in the initial one to two months often is slower, but the foals catch up by weaning time).

A foal on a commercial milk replacer often will have soft, watery manure, although that doesn't seem to cause significant problems. More serious is the incidence of gas and colic symptoms some foals suffer when being switched onto a milk replacer, and the possibility of constipation if the milk replacer is too concentrated. Some commercial milk replacer products have misleading directions on the package which, when followed, will result in a solution far more concentrated than real mare's milk (which is about 10% dry matter and 90% water). If you have such a product, you will have to disregard the package directions and aim to dilute it to the tune of one to 1 1/2 pounds of dry powder per gallon of water (or 110 to 190 g per liter), for a dry matter content of between 10-17%.

Although it should not be difficult to find a mare's milk replacer under most circumstances (if your feed store doesn't stock any in the spring, it certainly can order some for you), calf milk replacer can make a good emergency substitute, provided you locate one formulated with milk proteins (skim milk, buttermilk, whey, or casein) rather than soy or other plant or animal sources of protein, which a young foal is not equipped to digest. Look for a crude fiber content of more than 0.2% on the label as an indication that the product is based on milk protein. You also will need to determine that the product has at least 20% crude protein and 15% fat; 22% protein and 20% fat are even better (for both calves and foals).

Some calves' milk replacers are "acidified," a process that enhances its nutrient digestibility and also allows the reconstituted milk to be stored for up to three days without spoiling. These acidified milk replacers are a particularly good choice for foals. They are well-tolerated, cause a minimum of digestive upset, and might even be cheaper than non-acidified calf or mare's milk replacers.

Other kinds of milk replacers, such as those formulated for lambs, are generally a poor choice for an orphan foal. Most are considerably higher in fat, and far more concentrated, than mare's milk, and will be poorly utilized. Some breeders have had good success, however, with a 50/50 mixture of mare's milk replacer and goat's milk, an approach that might result in less diarrhea. With some foals, a process of experimentation might be necessary to find the ideal mix. If your foal isn't doing well, consider trying a different brand of milk replacer, offering

goat's milk, or mixing the two in different concentrations. Each time you make a change, give it a few days before you decide to try something else. Your foal might well adapt to the offering.

Bottle Or Bucket?

You have two options when feeding an orphan foal--offering milk from a bottle with a nipple attached, or providing it in a bucket from which the foal can drink. Very young foals are most likely to accept a bottle, at first; the usual recommendation is to use a large calf's milk bottle with a sheep's nipple (a human infant's nipple also will work for the first one to two weeks of life). The hole in the nipple should be small enough to prevent the milk from streaming freely when the bottle is inverted.

While the foal is learning to nurse, hand-feeding is the best approach; just be careful to keep the foal's nose below the level of his eyes, so that he can swallow easily (and to reduce the risk that he will aspirate the milk into his lungs). Once he has the hang of it, you can hang a bottle on the wall, as if your stall were a giant rabbit-cage. This way, your orphan will have free access. You will have to arrange the bottle so that the milk doesn't leak out on its own, and check it frequently to monitor consumption and make sure it doesn't become contaminated with bedding or dirt. Offer a new bottle every two hours or so, and thoroughly wash and rinse bottles and nipples after every use (formula residue is a perfect place for bacteria to grow).

Feeding by bucket generally is considered easier and faster than bottle feeding, so most breeding farms try to switch their orphans to a bucket system as quickly as possible. Foals usually adapt to a bucket fairly readily. Start by letting your orphan suck on your milk-wet finger (if he does not take hold at first, move your finger against his upper palate and tongue to stimulate the nursing response), then gradually draw him toward the milk until he is drinking from the bucket. Gently remove your finger. This process sometimes takes some patience, but most foals will begin to drink unassisted from a bucket in two hours or less (some only take a few minutes to catch on).

Puzacke says she has found it easier to start foals on a bucket system right from the start.

"People tend to get panicky and try to force the foal to drink--and then give up when it doesn't work right away. But if you're patient, you'll find that the vast majority of foals will get the idea."

Once the foal is successfully drinking from the bucket, hang one in his stall in an easily accessible location. A plastic bucket in a contrasting color (so the foal can find it easily) with a fairly wide mouth is the best choice.

Although you'll want to monitor the milk bucket for contamination on a frequent basis (and it should be replaced twice a day for freshness in any event), it generally can be left in the stall so that the foal can drink at will. (There is no advantage, by the way, in warming the formula; it's best left at the ambient temperature of the foal's surroundings.) Puzacke notes that in her experience, bucket feeding is preferable because foals can drink whenever they are hungry.

"They 'graze' on it," she explains, "and as a result, I think there's less digestive upset than when foals are fed at specific intervals."

Foals will work their way up to consuming four to five gallons a day of milk replacer or formula--about the same amount a mare will produce in a day at the peak of her lactation. There is little danger of overconsumption, according to most researchers. To make sure the formula stays fresh, however, mix only as much as your foal will consume in about 12 hours (half the daily ration).

In addition to the milk bucket, it's important to provide your foal with access to water. Around

the same time that he begins to be interested in solid food, he will begin to drink from the water bucket.

Switching To Solid

As useful as milk replacers are, most breeders agree that the sooner you get an orphan foal to start accepting solid feed, the better. A handful of milk-replacer pellets can be offered from the time the baby is about a week old. It might even be helpful to place a few in the foal's mouth (since he has no dam to demonstrate for him). Gradually, he will work his way up to consuming about two to three pounds of milk-replacer pellets, at which time he can start to receive a small amount of a commercial creep feed formulated for nursing foals. (He also should be offered small amounts of a good-quality legume-based hay, or good pasture, from the time he is a month old.)

By the time the orphan is eating four to six pounds (2-2.5 kg) of milk replacer pellets or creep feed a day, he can be weaned off the milk--sometimes as early as nine weeks or so. Most orphans can be completely weaned by the age of four months, after which they can be treated like any other weanling. This is the best time for an orphan foal to catch up on his social skills, going out with the herd, or, at least, with a companion (such as an older gelding, a barren mare, a donkey, or even a goat). Although orphan foals sometimes are a little more hesitant to explore their environments, they are by no means learning-impaired or "slower" than their normally-raised compatriots--and physically, they should be indistinguishable from non-orphan foals.

A recent study co-sponsored by Buckeye Feeds and The Ohio State University (where it was a Master's thesis project for Animal Science major Katie Larson and currently pending publication) examined 12 foals raised as orphans on Buckeye's Mare's Milk Plus milk replacer, compared with six foals raised on their dams, and found that in almost every way, the two groups of babies developed similarly.

"The preliminary results showed that the babies nursing on mares got a little fatter (with an average body condition score of six)," says Puzacke, "but skeletally, the orphan foals were the same size--and their body condition score averaged five, which is fine. I don't think we've communicated to the public strongly enough that orphan foals should not end up stunted. This study will be very helpful in making that clear."

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



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