

# Feeding Orphan Foals (AAEP 2012)

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It's an unfortunate reality that at one time or another, most veterinarians and breeders will face caring for an orphan foal. Whether a foal was orphaned because the dam did not survive parturition or because she rejected him, he requires special care from the very beginning. One aspect of his care that requires the most attention is his nutrition.

At the 2012 American Association of Equine Practitioners Convention, held Dec. 1-5 in Anaheim, Calif., Mary Rose Paradis, DVM, MS, Dipl. ACVIM (LAIM), an associate professor in the Department of Clinical Sciences at Tufts, in North Grafton, Mass., described the best ways to care for orphan foals' nutritional needs.

Paradis built on a concept basic to most breeders--that colostrum is essential for a foal's immunologic protection--and reminded her audience that colostrum is also key to a foal's good nutritional start. She recommended providing approximately 2 to 3 liters to orphans as soon as possible after birth. While bottle feeding is an acceptable approach, Paradis prefers to tube feed colostrum to ensure foals get as much as possible.

"It's liquid gold," she said. "I don't want to lose a drop."

In the event colostrum isn't available, she said, veterinarians should administer an intravenous (IV) transfusion of plasma with high immunoglobulin G (IgG) levels. Additionally, she said, owners and managers can use colostrum supplements or colostrum from other species as an adjunct treatment.

Paradis also recommended breeders and veterinarians prepare for orphan foal arrivals ahead of time by storing 200 to 250 milliliters of good-quality colostrum from other broodmares in a freezer. This banked colostrum is good for one to two years.

## Milk Sources

There are several options for obtaining milk for orphan foals, Paradis said, and she discussed three in detail.

**Mare's Milk**--Mare's milk is the best option, Paradis said, but it can be challenging to obtain. "Rare mares will adopt (orphan) foals in a herd and allow them to suckle" alongside their own foal, she said, but she emphasized that this is uncommon.

Another option for obtaining mare's milk is to lease a nurse mare with the understanding that she will accept the orphan and raise the foal until weaning, she relayed. As with other options, there are both advantages and disadvantages to procuring a nurse mare.

## Nurse Mare Foals

Choosing a nurse mare to feed and care for an orphan foal often raises a common question among owners and managers: What happens to her own foal? According to Mary Rose Paradis, DVM, MS, Dipl. ACVIM, each nurse mare farm has its own strategy for handling foals when their dams are needed elsewhere.

Most farms, she said, place foals in a "kindergarten" situation, where multiple orphan foals are raised and fed together. "This helps to socialize the foals and prevent excessive human bonding that can occur with raising the single orphan," she said.

Some farms, Paradis said, choose to breed foals with good bloodlines with the hopes that they'll be easier to sell when the time is right. Others keep filly foals to expand their broodmare herd.

Unfortunately, she said, because care protocol varies from farm to farm, not all nurse mare farms can boast good practices.

"I would recommend investigating potential farms for their practices and also for the health of the nurse mare," Paradis explained. "Probably this is best done by the veterinarian so they can make recommendations to an owner. Usually things are fairly intense when a foal is suddenly orphaned, and it is best to know your options before you need them."

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On the positive side, Paradis said, a nurse mare provides a foal with the social education he would lack if raised solely by humans, and procuring a nurse mare makes raising an orphan less labor-intensive for the people involved. Possible downsides to consider include:

- The financial costs involved with the lease (For instance, how much will it cost to get this mare? Will she reside at your farm, or will you need to pay to board her?);
- Some nurse mare farms require mares to be bred back before being returned;
- Nurse mares aren't always easy to find, and you might need to pay to ship one to your area;
- Bringing any outside horse on to a farm--nurse mares included--puts the rest of the equine residents at risk for contracting disease, so breeders should consider biosecurity methods and the nurse mare's farm of origin? before bringing her home;
- If the nurse mare becomes sick or injured while in your possession, know ahead of time who's financially responsible for her vet bills; and
- Nurse mare use creates a second orphan: the mare's own foal (see sidebar).

If an owner decides to use a nurse mare, Paradis said he or she should seek the following qualities: The mare should have a good mothering instinct, be successfully raising a foal (who is removed just before the new foal is introduced, or "grafted"), and have good milk production when introduced to the orphan foal.

Often, she said, mares are the bigger challenge when it comes to grafting orphan foals, as "hungry foals don't care what they nurse on." She recommended the following steps when grafting a foal:

- Because a mare's maternal recognition is driven by smells, confuse her senses by covering the orphan with a blanket worn by the mare's natural foal;
- Present the orphan's head to the mare's head first to allow her to sniff and investigate before proceeding;
- Have at least two people present during grafting--one controlling the mare and one controlling the foal;
- Keep the foal parallel to the mare to protect him from being kicked; and
- If the mare is aggressive toward the orphan, take it very seriously and reconsider grafting options.

Finally, Paradis said, be aware of several potential complications when grafting an orphan foal to a nurse mare:

- Foals that have never had the opportunity to nurse from mares might not understand the concept;
- Mares who've recently had stillborn foals might not accept an orphan;
- Previously bucket-fed foals might not want to nurse from a mare; and
- Mares that are still nursing their own foals might be reluctant to graft an orphan. Avoid this scenario, if possible, as it can be dangerous.

**Inducing Lactation**--Next Paradis described inducing lactation in barren mares. Ideally, she said, mares chosen for this task will have had at least one foal and have a history of being a good mother.

To induce lactation, Paradis said veterinarians typically use hormone treatments consisting of altrenogest and estradiol in combination with oxytocin and sulpiride or domperidone. She noted that it can take up to 14 days for lactation to begin with this method, so supplemental foal feeding will be required. She also noted that some mares have produced a small amount of colostrum. However, this is rare so orphans that will be grafted to these mares should be provided with colostrum.

Paradis also noted that grafting foals to hormone-induced lactating mares can be challenging, and she offered two suggestions that can help make the process easier. First, she said, stimulating the mare's vagina and cervix during foal introduction can alter her hormone levels and make her more willing to accept a foal. Additionally, housing the mare and foal next to each other during hormone treatments can increase the odds of the mare successfully accepting the foal.

**Mare's Milk Substitutes**--In many cases inducing lactation in a barren mare or obtaining a nurse mare aren't feasible options for owners. Owners typically hand-rear these orphans, which typically consume a powdered or pelleted mare's milk replacer. Powdered products, which must be reconstituted with water, can be fed to younger orphans, while pelleted products are often fed to older foals, she said. Paradis said breeders and owners can choose from numerous powdered products, some of which are acidified and can be left out for the foal to consume in his own time.

Paradis noted that while substitutes are designed to have similar nutrient and micronutrient levels as mare's milk, some variations exist. For instance, she explained, mare's milk contains roughly 10.7% total solids, 25% crude protein, 17% crude fat, and 0% crude fiber, along with 580 kilocalories (energy) per liter of milk. Studies have shown that three replacers, prepared to manufacturers' specifications, consisted of 11-16% total solids, 19.5-25% crude protein, 14-16% crude fat, and 0.1-0.15% crude fiber, along with roughly 438 kilocalories per liter (one manufacturer did not list the energy provided). Additionally, researchers have shown that most milk replacers' micronutrient concentrations exceed those of mare's milk.

"The healthy foal does not have difficulty in handling this excess," she explained. "However, if you are feeding a foal that may have renal compromise (as evidenced by elevated potassium levels), it can become a problem ... dilution of the formulas to half strength may be helpful."

Additionally, Paradis cautioned that some foals develop diarrhea when introduced to a milk replacer. To combat this, she recommends starting the foal slowly, feeding 10% of his body weight in milk replacer per day and increasing that amount by 3-5% daily until he is consuming 25-35% of his body weight per day (a rate at which most normal foals consume milk).

**Milk from Other Species**--Finally, Paradis described an approach that owners and managers occasional employ: using milk from other species to feed orphan foals. She cautioned that this practice could pose problems for the foal, simply because the foal's GI tract is designed to process nutrients in mare's milk; other milks possess different nutrients. For example, both cow's and goat's milk are higher in fat than mare's milk, and cow's milk is lower in sugar. She noted that of the two, foals typically digest goat's milk better than cow's milk, but goat's milk can still occasionally cause complications including constipation and metabolic acidosis.

## Feeding Methods

If an owner does not acquire a surrogate mare, there are several different ways to feed an orphan. Bottle feeding is a common choice, Paradis said, but it has its drawbacks, including an increased risk of developing aspiration pneumonia, an increased human/foal bond (which can lead to behavioral problems, as covered in another session during the convention), and its labor-intensive nature.

Paradis recommended bucket feeding as a more practical alternative. She said this method is less time-consuming and causes fewer human/foal bond issues than bottle feeding, and most foals learn quickly how to drink from the bucket ("Be prepared to be covered in milk by the end of this lesson!" she cautioned).

Paradis also reminded that--whether the method of choice is bucket or bottle feeding--foals must eat frequently. She relayed that very young foals typically need to be fed every 90 minutes (which amounts to 16 times per day), with the frequency decreasing to five times daily by the time they reach 15 days of age. As feeding frequency decreases, she noted, the foal's meal size should increase appropriately.

It's also important to offer orphan foals water, hay, and pellets early in life, options they would encounter if they were alongside dams. Some foals actually prefer milk pellets over milk replacers, Paradis said, and these can be made into a mash if the foal prefers.

Paradis noted that owners can wean orphans from milk as early as two months of age, but she recommended delaying weaning until the three- to four-month mark when dams and foals are typically separated. She also recommended slowly mixing normal grain and forage with milk replacer and pellets until the foal is weaned off the latter two completely.

## Take-Home Message

Raising an orphan foal is a tremendous amount of work, Paradis said, and it requires a committed owner or handler who is able to provide a proper diet. But if it's done right, foals can thrive and prosper.

In closing, Paradis noted that researchers are currently studying how orphan-raising methods impact foals later in life. They are seeking information from both owners and veterinarians via a survey, which will include questions on feeding practices and behavioral assessments of foals that have either been raised on nurse mares or hand-reared. Paradis said the research team is hoping that "a large number of participants will help us understand the best practices in raising the orphan foal." Interested individuals should contact Paradis at [MaryRose.Paradis@tufts.edu](mailto:MaryRose.Paradis@tufts.edu) for more information.

Disclaimer: Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.