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The Case of the Foal with Two Mothers

Rare horse adoption takes place at Mizzou.



Ren, now a healthy 1-year-old gambolling at Stonebridge Farm in Luebbering, Missouri, had a complicated birth requiring surgery at MU's Veterinary Health Center. His well being also owes much to an adoption orchestrated there. Photo by Shane Epping.

Story by Dale Smith

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At least at the start, May was a happy month for Susan Werner, a great lover of horses. Her mare Davina was about to foal on a 100-acre property near St. Louis. Davina's offspring was to be named Ren, and if the genetics proved genial, he would possess ample grace and power for a career in jumping and dressage competition.

Then the day came in early May. Werner left home on her way to work. During the drive, the farm caretaker called with news that Davina was getting ready to foal — she was restless, sweating and streaming milk — and if Werner wanted to see the birth, she should get there fast. The veterinarian was on his way, as well. A few minutes later, Werner got another call. Davina had been rolling in her stall and gotten "cast" against the wall. She had a hard time getting up, and although the caretaker was able to move her, she kept rolling and risked getting cast again. Werner gave permission to move Davina outside. "When I arrived at the barn, it was pretty clear Davina was in pain, and even though this would be her first foal, she was acting more distressed than normal," Werner says. The vet came shortly, and it soon became clear Davina needed more care than he could deliver on the farm. They would take her to MU's Veterinary Health Center.

Although Werner was right that Davina was soon to foal, it turned out that the mare also had colic, a catch-all term for certain gastrointestinal ailments to which horses are prone. This was troublesome news. A round of medication did not help, and Davina was soon an emergency case. Before it was all over, mother and foal would need the combined expertise of four veterinary specialties to survive.

At the hospital, Dorothy Whelchel, assistant teaching professor of equine medicine, evaluated Davina. The mare, still in abdominal pain, rolled and stamped and twitched and would not be consoled. Even with pain medication, Davina's discomfort persisted, and her heart raced. Whelchel started to think Davina may have a twisted intestine, one possible cause of colic. But, she says, "You can't fix that with medication." The problem was getting worse. After consulting with surgeons and reproductive experts, Whelchel told Werner her mare needed surgery to correct the problem.

Operating on a mare near full-term is risky for mother and child. The fetus may sense its mother's distress, and delivery could commence during the procedure. Or, the surgical team might discover that the uterus and its 200 pounds of cargo prevent repair of the intestine. If so, they'd have to cut open the uterus and perform an emergency Cesarean section to deliver Ren before moving on to correcting the cause of the colic. C-sections routinely go well in humans, but the procedure is risky for foals.

So a question was put to Werner: If problems arise in surgery, should the team prioritize the life of the mare or the foal? Her answer left little room for error. She insisted that surgeons emerge from the operating room with a healthy mother and offspring.

Three teams — surgery, anesthesia and medicine — were on duty when Davina went into the operating room.

Unfortunately, the uterus did block surgeons' path to the colic, which turned out to be a piece of small intestine trapped between the stomach and spleen. Shannon Reed, teaching professor of equine surgery, performed the Cesarean section to deliver Ren and correct Davina's colic. As soon as Ren was delivered, the medical team stabilized the foal.

Although the delivery went well, that bit of good fortune was short-lived. The next day, Davina rejected Ren. Because the foal arrived by Cesarean section, Davina experienced neither vaginal birth nor its accompanying cascade of hormonal



During Ren's birth and first few days of life, he relied on MU's specialists in surgery, internal medicine and animal behavior. Photo courtesy Susan Werner.

events, which do much to unite mother and child. Ren was, in effect, an orphan.

Plenty of methods exist for feeding an orphan foal. In one creative approach, a lactating goat is taught to hop up on a straw bale to achieve proper elevation for nursing the equine baby. Or, humans can spend a great deal of time and energy bottle-feeding foals formulated milk replacement and otherwise serving as mother. But this is fraught with problems, says Dietrich Volkmann, teaching professor of theriogenology (reproduction).

Bottle-feeding procedures rest on well-established science, he says. But a horse raised by a human is, behaviorally speaking, not a horse. "It thinks it's one of us. Because horses eventually grow quite large, they become dangerous when they try to play their games with us, their fellow beings," he says. "For example, when foals play with each other, they buck and they kick. They'll play that same game with you, and you may become accidental damage." Setting boundaries is a problem, too. "We humans are not prepared to kick the foal like the mare would, as if to say, 'No, you are out of line, you must never do that again.' "

Ren faced physical risks as well. Because Davina rejected him, he missed some of the first few days of mother's milk containing colostrum and its multitudinous antibodies that normally transfer protection against infectious disease to the foal.

What would become of poor orphaned Ren?

Volkmann knew a procedure that just might do the trick. Earlier in his academic career, he worked at Cornell University with a colleague who pioneered a sort of adoption process for horses. It could work for Ren.

Step one: Find a mare who had nursed a foal at least once in her life and who was available now to adopt Ren. Retired mares are common enough, and Werner quickly found Ubiquitous for the job.

Step two: Phone an equine pharmacy in Kentucky, a stronghold of racehorse breeding, and order a set of hormones to prepare Ubiquitous' udder for lactation. Within a few days, Ubiquitous was hormonally transformed into a pregnant horse, except she had no fetus.

Step three: Early on the day of the adoption procedure, Volkmann ordered that Ren's feedings be withheld so he would be hungry for Ubiquitous' milk. "Now you are playing a relatively dangerous game," he says. "If you don't feed the foal enough, it might become weak and collapse. This can happen very quickly, so we had to feed Ren just enough to keep him going but not so much that he would have no interest in the udder."

Step four: When the time was right, Volkmann put Ubiquitous in a stall, facing Ren, who stood in the arms of a caretaker.

Volkmann commenced a simulated birth by stimulating Ubiquitous' vagina, which triggered her milk flow. He also manipulated her cervix, which releases the hormone oxytocin to induce mothering behavior.

"Suddenly," Volkmann says, "Ubiquitous nickered, which is very maternal speak. When she did that, we brought Ren a little closer. Then we guided Ren to the udder. Once foals taste that milk and get hooked on it, then we've got a mare and a foal. It's perfect. This one went according to the textbook."



Ren with adoptive mother Ubiquitous. Courtesy Susan Werner.

Elapsed time in the stall: About 10 minutes.

Volkmann says this procedure is performed perhaps 50 times a year, almost exclusively in the aid of orphaned thoroughbred foals worth hundreds of thousands of dollars.



Ren (background) with biological mother Davina. Photo by Shane Epping.

But the procedure need not be reserved for potential winners of the triple crown. “We simulated the hormonal profile of pregnancy,” Volkmann says. “And, voilà, we can fake pregnancy, and we can fake birth, and then we can fake motherhood. That has tremendous teaching value. I get goosebumps thinking of it.

“Plus,” he says, “it’s easy. Anybody who is comfortable doing reproductive work on horses — which means being on the wrong end of the horse, the kicking end — can do this. The first time, I read a half-page instruction and did it. It worked then and has never failed.”

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