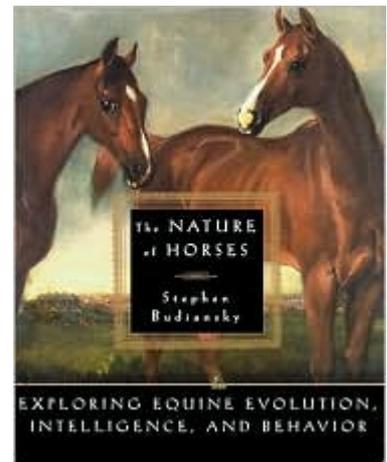


Makin' Babies: The Influence of Breeding Technologies, Part I

by Kristin Berkery

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Technology lets us do amazing things, even in the horse business. Thanks to [artificial insemination, transported semen, and embryo transfer](#), it's possible to have two or more foals from a single mare who's never been in the same state – or country – as the sire. There are all kinds of pros and cons to these developments. The theory behind artificial insemination (or AI) and transported semen is that it can diversify the gene pool by giving stallions the chance to sire foals in far-off locations. Embryo transfer allows mares to prove themselves in competition at the same time they are producing foals. In [The Nature of Horses](#), author Stephen Budiansky argues that in the milk cattle business,



[The Nature of Horses at BN.com](#)

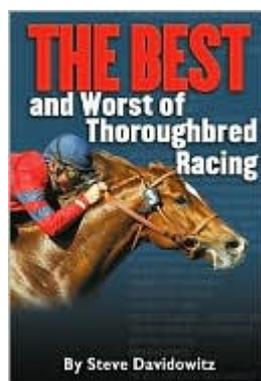
“The widespread availability of AI services enormously increased competition among potential breeding stock... with AI the offspring of any given bull were now available to anyone. The cachet of pedigree was undermined, and in its place came hard-headed demands to see the bottom line on performance... Not surprisingly, this change has led to a rapid improvement in the average milk output of dairy cattle.”



Equine artificial insemination. Photo by the Haras National Suisse

I won't pretend to be an expert on cattle breeding, but there is the obvious risk that most breeders will only want to use the few bulls who sire the top milk-producing cows – resulting in a more limited gene pool over time. To ensure diversity, breeders must have the foresight to use “less popular” sires who are still very good quality, although that might mean slightly lower sale prices and [milk production](#) in the short term.

But the goals of horse breeding are different than in milk cattle breeding. Budiansky explains that AI could radically improve the [Thoroughbred](#) breed, allowing mares and stallions to prove themselves on the track while also producing foals, which could lengthen those horses' racing careers and allow breeders to judge the horses' abilities objectively when making breeding decisions.

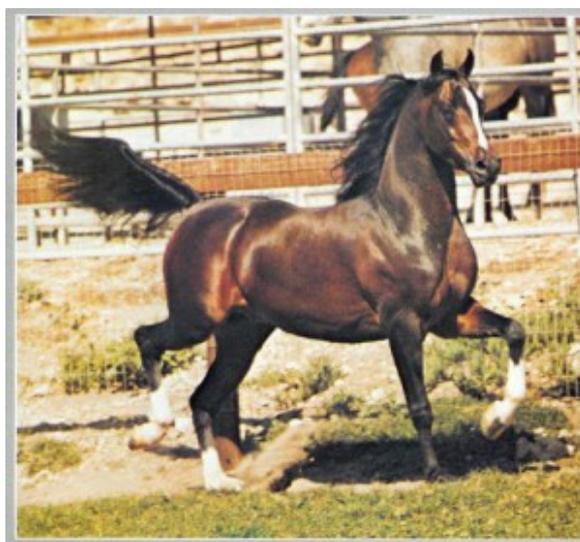


[The Best & Worst of Thoroughbred Racing](#)

Today's [Thoroughbreds](#) generally have short racing careers, which some would argue is a result of breeding horses more

prone to breaking down. If the registering authority for the Thoroughbred breed in the U.S. and Canada, the Jockey Club (JC), allowed AI, perhaps breeders might start producing horses that are proven to remain sound longer. If embryo transfer was approved by the JC, maybe we'd see more fillies racing against colts instead of being retired to the broodmare barn. These developments could improve the breed's quality over time.

But how have [AI, transported semen, and embryo transfer](#) affected other breeds? Without a doubt, AI changed the face of the Arabian breed by allowing stallions to breed multiple mares with just one semen collection. [*Bask](#) became the first Arabian stallion to sire more than 1,000 purebred foals, due in part to the approval of AI by the American registry in 1977.



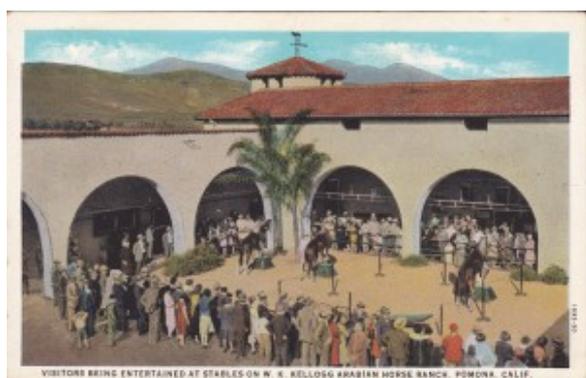
The Arabian stallion Huckleberry Bey, who sired foals after his death in 1992 thanks to artificial insemination and frozen semen.

Older stallions who had trouble mounting a mare could now be collected and used for breeding. Horses with busy competition

schedules could be collected and the semen frozen or cooled for later use. Valuable stallions could also avoid being injured during breeding by never coming into contact with mares. Even stallions who had died could still sire foals from stored semen.

Of course AI opened a new door to the possibility of fraud, because now another stallion's semen could be substituted and the mare owner would never know – or semen could be implanted in a different mare than the one listed on the breeding certificate. Blood typing was used as a solution: After a foal was born, its blood type would be determined and compared to the blood types of its parents. If a foal's blood type couldn't possibly be the product of a specific stallion or mare, then the registry could reject the application for possible fraud. Blood typing was not foolproof, but it worked about 96% of the time in Arabians, according to geneticist [Ann T. Bowling](#).

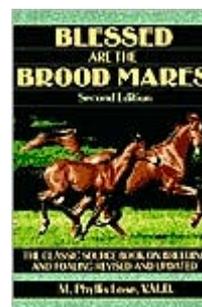
In 2000, DNA typing became a requirement in Arabians, which made the process of identifying parentage more reliable than blood typing.



The Kellogg Ranch in Pomona, California.

When [transported semen](#) was approved in Arabians in 1995, some breeders were excited about the potential of new diversity in the breed. Previously, different regions of the country were known for their concentrations of specific bloodlines because of the stallions standing at stud in those areas. For example,

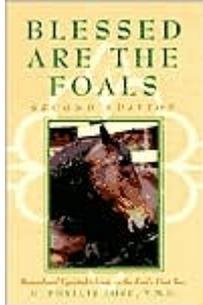
there was a large population of straight [Egyptian Arabians](#) in [Texas](#) thanks to some well-financed Egyptian breeding farms, and Crabbet-Maynesboro-Kellogg horses were easy to find in [California](#) because of the [Kellogg Ranch program](#) that dated from the 1920s. With transported semen, stallions in more isolated areas or with rarer bloodlines were now accessible to anyone, potentially increasing their influence on the breed.



[*Blessed are the Broodmares*](#)

So [transported semen](#) made it possible to produce foals in one part of the country by a stallion who lived elsewhere. Did it diversify the breed by “spreading out” bloodlines in different locales? There are valid arguments that it hasn’t worked out that way. Instead, transported semen has inadvertently turned breeding decisions into global popularity contests. Previously breeders would choose a stallion that was geographically close to them because they had to transport their mares to the stallions’ locations, but now anyone can pick a stallion anywhere in the world without moving their mare.

Part of the reason transported semen has turned [Arabian breeding](#) decisions into popularity contests is because most of the high-dollar sales are of horses shown at or qualified for regional and national shows in performance or, most often, halter (or breeding) classes. These competitions are judged subjectively by opinionated humans, unlike in [Thoroughbred racing](#) where the impartial clock is the deciding factor. A judge at an [Arabian show](#) can favor a particular horse or bloodline, making it more popular with breeders. Under most current show rules, there is no unbiased way to assess the quality of a show horse as long as humans are deciding who should win.



[*Blessed Are
The Foals* by
M. Phyllis
Lose, DVM](#)

Nowadays, a breeder may make a breeding decision based on a promotional video and without ever seeing a stallion in the flesh. This allows slick marketing, instead of in-person scrutiny, to influence breeding trends. It also allows more breeders to focus on fewer bloodlines in the quest to create marketable offspring, which can result in less diversity overall. And the reliance on [transported semen](#) favors stallions with semen that handles freezing or cooling well – but it's a disadvantage for stallions with average fertility whose semen does not remain viable during transport.

In the next installment of [*Makin' Babies*](#), we'll examine some of the effects of embryo transfer, the necessary safeguards against breeding fraud, and the possible future of the Arabian breed as a result of these new technologies.

part I | [*part II*](#) | [*part III*](#) | [*part IV*](#)