

## Stallion Fertility

One question frequently asked is, "Are some males more fertile than others?" From life experiences the answer seems to be an obvious "yes."

But in academics the answer to this question is not so obvious. First, a quantitative analysis must be accomplished in order to measure the differences in fertility of males. (It has been said that in graduate school, the masters student tests the hypothesis of what occurs, the Ph.D. student studies why it occurs, and the research scientist then figures out how to control it.)

Having minds somewhat warped from too much education, we tend to look at problems from this academic perspective. But having a life outside the university environment we also have to be somewhat more practical.

Available research on stallions shows that some horses are more fertile than others. In the real world this translates in the fact that some stallions are physically able to get more mares in foal than are other stallions.

With stallion sperm being shipped around the world either cooled or frozen, the fertility or potency of each stallion takes on new meaning. Just as some males are more fertile when breeding naturally, the same is true for transported fertility. Some semen ships or freezes better than others.

Once research determined that there was a difference in stallion fertility, the question of why this is the case came up. It was discovered that one reason for the difference was the fluids that the sperm cells swim around in.

In highly fertile males, this liquid environment - the seminal fluid - is more hospitable to sperm cells than is the fluid in less-fertile males. It is up to the research scientist to figure out how to manipulate this phenomenon.

They found that by spinning down a filtered ejaculate (an ejaculate that had the gelatinous plug removed) in a centrifuge at 1,500 rpm for 10 minutes, the sperm end up on the bottom of the test tube and the problematic seminal fluid is at the top where it can be easily removed.

This allows the addition of a man-made extender that is more beneficial to

the sperm cells than is the natural seminal fluid. Adding extender can increase the sperm's life span and may improve its overall strength. This technique can also make transport and freezing more feasible for the less-fertile horse.

The key, of course, is finding the right extender for a particular stallion. There are several commercial extenders on the market that can be used either with or without the spin-down technique. Most are milk-based but some are lactose-free.

It is important to find the extender that performs best in livability trials for each and every stallion. Stallion sperm tends to prefer one extender over another in these trials.

One home-grown formula we have found effective is to use 50% non-sweetened evaporated milk and 50% of 5% dextrose water. We normally try to create a 2-to-1 extender/ejaculate solution. For example, if the original filtered ejaculate is 50 ml, we add 100 ml of extender to the semen for artificial insemination-either fresh or cooled.

Of course, the technique used to combine the sperm with the extender ultimately determines the success of this process. The extender and the semen must be very close to the same temperature before mixing. Semen arrives in our hostile environment at about 97 degrees. We try to get our extender at about 99 degrees and make the combination within 3 minutes of collecting the semen.

Remember a few degrees warmer is definitely better than a few degrees cooler. Sperm cells experience damage if exposed quickly to cooler temperatures.

Semen viability is only one aspect of stallion fertility. Still other factors, some of which those Ph.D.s haven't even found yet, exist in determining a stallion's potency as a breeding animal.

— Dr. Jim and Lynda McCall

For more information about stallions, visit the McCalls at their Web site: [www.the-old-place.com](http://www.the-old-place.com) and post your horse questions at their on-line forum.