

Artificial insemination (AI)

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Artificial insemination

Selective breeding of our domestic horses has been carried out over hundreds of years and has brought about the establishment of the many different horse breeds we see today. Stallions and mares may be selected on speed, strength, temperament, conformation, colour and other traits that are desired by the horse breeder. The stallion of course, because he can potentially sire hundreds of foals, can bring about the greatest change to a breed.

Traditionally mares have been taken to the stallion for natural service which may be by hand mating or running the mare with the stallion.

Artificial Insemination, which has become very popular over the last 40 years, has had a major positive impact on the horse breeding industry (except thoroughbreds where it is still outlawed). It involves collecting semen from the stallion, chilling or freezing it and transporting it to the mare where it is introduced into the uterus by a veterinarian or a suitably trained technician.

Why AI?

There are several advantages artificial insemination has over natural service.

- ♦ The mare and stallion never have to come in contact with each other, which therefore reduces breeding accidents, such as the mare kicking the stallion. This can also reduce the spread of sexually transmitted diseases
- ♦ **AI** opens up the world to international breeding, as semen may be shipped across continents to mares that would otherwise be unable to breed to a particular stallion.
- ♦ The mare does not have to travel to the stallion, so the process is less stressful on her and less expensive for the owner.
- ♦ **AI** can overcome some fertility issues by reducing the contamination introduced by natural service.
- ♦ **AI** has an approximately 10% higher success rate than natural service.
- ♦ **AI** allows mares or stallions with health issues, such as sore hocks which may prevent a stallion from mounting, to continue to breed.
- ♦ Frozen semen may be stored and used at a later date. This can allow preservation of genetics that would otherwise be lost on the death of a stallion.

What is involved?

Depending on requirements we can provide full management over the breeding period including agistment or, if you live close to the clinic, you can transport your mare to and from our equine treatment area. The other alternative is we come to you if you have suitable facilities including a crush, preferably under cover, and power for our ultrasound equipment.

Fresh or Chilled Semen

Organizing semen: Once you have selected a stallion of your liking then it pays to do some homework. Most stallion owners will require you to sign a contract and pay up front before they will undertake to deliver semen to you. This is fairly standard procedure. But, read the fine print.

- ♦ Is there a live foal guarantee and is this valid across seasons and potentially between mares?
- ♦ What will extra collections cost if your mare doesn't get in foal the first time?
- ♦ What is the fertility of the stallion?
- ♦ What are the delivery costs?
- ♦ Are there times during the season when the stallion is unavailable?

Preparing the mare: To optimize conception rates we need to optimize the timing of insemination. This is one of the advantages over natural service as we can greatly reduce contamination introduced into the uterus by only inseminating a single cleaned ejaculate. To accomplish this however we need to know when the mare will ovulate.

In mares that have an obvious heat, we perform an ultrasound examination (scan) of the ovaries and uterus early in the cycle to evaluate follicle size, softness and uterine tone to predict the best time to inseminate. This will usually involve more than one ultrasound exam.

Alternatively we can induce the mare to cycle with an injection of a hormone called prostaglandin and then examine the mare 3 days later. We monitor the development of a follicle until it reaches a certain size and the uterus has the appropriate tone for us to predict ovulation is approximately 24 hours away. Fresh semen is ordered for the next day and we usually administer another hormone, Chorulon, to help induce the ovulation. The mare is inseminated and we will usually scan her the following day to confirm that she has ovulated.

Confirming pregnancy: We recommend that ultrasound examinations be performed at 17 days to confirm pregnancy and check for twins. A further check should be performed at day 42 to confirm the pregnancy has progressed without problems.

Costs: Ultrasound examination: Although there are individual variations, on average we would expect to have approximately 5 ultrasound examinations performed on your mare during an insemination cycle. This is up to and including a 17 day pregnancy scan. These are currently priced at \$75.00 per examination if performed at the clinic or through Otaki Equine Services but will cost \$95.00 plus travel costs if we come to you. The costs of the hormones used and insemination itself is approximately \$190.00 plus travel costs if we are coming to you.

If you are planning to take advantage of the facilities available at Otaki Equine Services for the period of insemination then an agistment cost of will be charged at \$30.00 per day. This includes yarding, feeding and handling fees during this time and will generally involve a period of about 5 days. If you wish the mare to remain until pregnancy is confirmed on ultrasound then a reduced charge of \$15.00 per day would apply.

Frozen Semen

The use of frozen semen is becoming more common in horses due to better freezing techniques and therefore more successful breeding. However, breeding with frozen semen in horses is still much more labour intensive compared to using fresh or chilled semen.

Preparing the mare: Although the general principles are the same, frozen sperm once thawed do not live as long as fresh or chilled sperm so the timing of insemination is even more critical for success. Mares bred with frozen semen are examined daily with ultrasound and up to four hourly when ovulation is close. Our aim is to inseminate within four hours of ovulation. When the mare is deemed ready she is cleaned thoroughly, the semen dose is removed from storage in liquid nitrogen and immediately thawed using temperature controlled baths. Depending on the fertility of the stallion, the dose of semen will vary and the insemination technique will differ, but basically the semen is deposited at the end of the uterine horn closest to the ovary where ovulation has taken place.

Costs: The numerous ultrasound examinations required, day and night and weekends, increases the expense of using frozen semen. With this in mind and to allow better planning by mare owners we have established a fixed price insemination plan for frozen semen. This is currently set at \$750.00 and includes everything up to and including a 17 day scan to confirm pregnancy. Other additional costs incurred for frozen over and above chilled are semen storage at \$23.00 per month and a one off insurance fee for semen at \$138.00. Hopefully we can reduce this insurance fee with more frozen semen stored.

Because of the intensive nature of frozen semen insemination, we recommend you take advantage of the agistment services offered which due to the nature of the management are at a slightly increased rate of \$40.00 per day during insemination period but remain at \$15.00 per day for period up to pregnancy confirmation.

Potential problems and what they might mean:

Spring Transition

During early spring, transition mares show irregular periods of sexual receptivity, prolonged heats of 10-20 days, split heats, and heats without ovulation. You cannot predict which of the transition follicles will ovulate. The simplest solution is to wait. Most mares will be out of transition stage by mid October. If this is not an option for you for some reason then there are hormones available that ease the transitional signs with the net result being increased fertility earlier in season.

Sub fertile mares

There are many factors that may contribute to decreased fertility in mares.

However decreased fertility can be divided into 3 broad categories

- 1) Mares that fail to cycle normally.
- 2) Mares that cycle normally but don't conceive.
- 3) Mares that cycle normally and conceive but then suffer early embryonic death (EED).

The first step is to establish at which stage the problem is occurring and target appropriate interventions to this area. For example a mare that does not cycle normally may need hormonal treatments to allow us to take control of her oestrous cycle and encourage ovulation. A mare that cycles normally but continually develops fluid in her uterus post service may need uterine flushing post service or antibiotics during the period of oestus to encourage fertilization. A mare which is conceiving but loses the embryo early (often before even the first scan) may require hormonal management post service or could potentially have a hostile uterine environment, such as an endometritis, that requires addressing. In some cases these mares may be a candidate for embryo transfer.

Obviously factors affecting the fertility of your mare can potentially increase the costs involved however as each case is unique this is something we would need to discuss with you at the time if necessary.

What can you do to maximize the chances of a successful outcome?

Be organized early. Give yourself time to consider all the options and make informed decisions. Consider the costs involved and all potential outcomes. When selecting a stallion consider what traits you desire in your foal and whether he is likely to pass these on. Also consider his fertility relative to your mare. In identified sub-fertile mares selecting a stallion with good fertility is essential. Be prepared not only for the process of breeding but also the management of the pregnant mare, foaling, and managing the mare with her foal afterwards. Are you set up to foal a mare or will you need to send her to a professional unit? Is your property suitable for foals? These are all costs which can be overlooked when deciding whether or not to breed. Once decisions are made ensure the mare is prepared for the breeding season. Any concurrent disease will affect negatively on fertility. Ensuring your mare is healthy and in good body condition will maximize your chances of early success. In some mares having trouble conceiving with no apparent reproductive specific problems I have found the solution could be as simple as having a dental performed! In humans one of the highest causes of infertility is periodontal disease!