MARE MANAGEMENT WHEN BREEDING WITH FROZEN SEMEN

Historical Perspective

Historically strategies for the use of frozen semen were simple, breed after and as close to ovulation as possible. The protocol for achieving this was also simple (at least in design), check the mare every six hours while in estrus to ensure that she was not bred more than six hours after ovulation. Several factors were involved in the development of this strategy. At one time all frozen semen was more of a rarity and with that it was more difficult to get and more expensive. Most all the people providing it did so with the mind set of selling it by the dose and often one dose at a time. There was also concern about the longevity of thawed semen and that due to premature capacitation it would not last longer than six to eight hours in the mare. And there was concern about frozen/thawed semen causing a uterine inflammatory response which also dissuaded veterinarians from two inseminations in the same cycle.

Success was achieved with this protocol and as new clients and practitioners entered the arena of frozen semen use, they merely adopted what was standard operating procedure. However, with this strategy comes with its own set of problems. The demands on the practitioner's time in managing these mares are enormous. Checking a single mare four times a day is difficult at best and this difficulty is magnified greatly when that mare is in an ambulatory setting, rather than at a clinic. The cost to the client is also great and again is amplified when in an ambulatory setting. These two issues alone have dissuaded many clients and/or their veterinarians from getting involved in frozen semen use.

Recent research studies as well as much more industry use just in the past two to three years, have at least partially dispelled some of these theories or concerns. Researchers and practitioners alike have worked at developing strategies for the use of frozen semen that are less management intensive for the veterinarian and more economical for the client yet achieve desired results.

Developing Protocols

Some people using frozen semen have adopted a more conventional approach to inseminating mares in that they will only check (ultrasound) mares once daily. They begin breeding once daily when the mare has an appropriate sized follicle and do so until she ovulates. This is obviously a trade off between the usage of more semen for less veterinary management. This management scheme has also been utilized by using "half doses" of semen (e.g. 400 million total sperm vs. 800 million sperm per insemination). When mares are bred at least twice proponents of this protocol claim similar results to the traditional post-ovulation insemination method. Another obvious alteration of this protocol is to use an ovulatory agent when the mare is in an appropriate stage of estrus and then begin the inseminations 24 hours later and daily after that.

What is being termed as timed insemination techniques have also been adopted and then tweaked by many practitioners. Examples of these are as follows.

Once a mare has been determined to be in estrus and has built a follicle of 35mm or greater she is given HCG. She is then checked and inseminated at 24 hours and at 40 hours. Most mares will ovulate between these two checks guaranteeing that insemination occurs in less than 12 hours prior to ovulation or less than 6 hours after ovulation (and maybe both). If in fact the mare ovulates prior to the 24-hour check it is up to the veterinarian to decide what to do, inseminate or cycle her back. If the follicle has not ovulated by the second check (40 hours) again the veterinarian must decide what to do. Inseminate and continue checking her or wait until she ovulates and inseminate her at that point. Most mares that are 16 years or younger will ovulate in the window and not force these choices on the veterinarian. As with the previous protocol this has been done using "half doses" at each insemination with acceptable results.

The same basic protocol has been done with the use of *Ovuplant* rather than HCG. On a statistical basis *Ovuplant* will result in ovulation several hours later than HCG so the protocol is probably better designed if the hours of insemination are adjusted accordingly. Inseminating at 36 hours and 48 hours seems to work well with this protocol in that the mare usually ovulates in that window. Again the concept being that insemination has occurred close to and on both sides of ovulation.

These techniques often result in the use of more semen than the older post-ovulation method. This fact may affect the cost to the client depending on how the semen was purchased. However, veterinary costs and management demands are much less. As an added advantage, the timed insemination also allows the veterinarian to design the timing of these inseminations to best fit his/her schedule.

An issue that becomes important with any timed insemination protocol is that the mares be followed starting early in there cycle. The practitioner has a much better opportunity to either "plug this mare in" to the standard protocol or to tweak it for her depending on how she is presenting as her heat progresses. In contrast, for ske of an example, if a mare arrives for her first check with a 44mm follicle and no uterine edema it is difficult to "plug her in" with any degree of confidence.

The post-ovulation method can also be modified by the use of ovulatory agents. If the agent is given at the same time as described for the timed insemination technique the veterinarian is usually safe not to perform the first check on these mares for 24 hours (HCG) or even 36 hours (*Ovuplant*). After this first check then the 6-hour checks can begin. This at least will minimize the number of exams helping both the veterinarian and the client.

Conclusion

Obviously there are factors that can steer you toward one or the other protocol. Availability of semen is certainly one factor. If the client is unable or unwilling to get more semen then a post-ovulation method may make the most sense. If the stallion is dead then conservation of that semen may be a major issue as well. Besides the timing of insemination, the method of insemination may be called in to play in these instances. Deep uterine insemination techniques designed to enable the use of lower doses of semen can be employed. (These techniques are only practical if the semen is provided in multiple small straws). There is disagreement as to the effectiveness in achieving suitable pregnancy rates with low doses of thawed semen with rectally guided deep uterine pipettes. However there is general acceptance that endoscopic deposition of a low dose of semen on the papilla

of the oviduct does achieve very acceptable pregnancy rates. Employing these techniques can even allow for use of a timed insemination technique with a “single dose” of semen, even multiple cycles.

The fertility of the semen being used is always an issue that goes further than what method of insemination is chosen. Obviously judgments (predictions) are made about a horse’s potential fertility based on the motility of the thawed sample. However, exceptions to these “rules” are found on both sides of the spectrum all the time. Everyone in the industry is best served to remember that pregnancies and conception rates are the best measure of fertility.