



Foundations

Technology & Service Strengthening
the Equine Breeding Industry

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Select Breeders Services, Inc

(877) 658-3328
North America 410.658.3328
Europe 39 0372 65224
Australasia 61 03 58 299 566



For more information about frozen semen and SBS locations visit:

www.selectbreeders.com

Search Stallions
www.siredirectory.com

4th International Symposium on Stallion Reproduction

Hannover Germany
October 21-23, 2005
Dr. Ed Squires, Ph.D, ACT (hon)

The 4th International Symposium on Stallion Reproduction was held in Hannover Germany. This area of Germany has a long tradition of horse breeding and research on reproduction in stallions. Rightfully so, Dr. Erich Klug of Hannover was the honorary chair. Dr. Klug is a mentor to many in the field of equine reproduction and a prominent equine scientist. The organizing committee for this meeting included Dr. Marco Alvarenga (Brazil), Dr. Ben Colenbrander (Holland), Dr. Michele Magistrini (France), Dr. Juan Samper (Canada), Dr. Dixon Varner (USA), and myself. Sixteen speakers were invited to give presentations and forty-five abstracts were accepted for either oral or poster presentation. Over 200 scientists and veterinarians were in attendance.



The presentations were divided into the following sections: Puberty and Spermatogenesis, Genomics, AI Strategies, Assessment of Semen Quality, Preservation of Fresh and Cooled/Transported Semen, Stallion Management, Cryopreservation of Stallion Semen, Assisted Biotechnologies, Role of Sperm and Seminal Plasma in the Female Genital Tract and Future Aspects of Stallion Reproduction. Four workshops of a practical nature were included: Prediction of Stallion Fertility, How to Inseminate the Problem Mare, Clinical Aspects of Stallion Fertility, and Advances in Frozen Semen Technologies. It is impossible to comment on all the presentations, but I will highlight a few. The proceedings of the meeting are published in *Animal Reproduction Science* 89 (2005) 1-2. *continued on page 3*



Frozen Semen At Work: Popeye K

A major benefit of frozen semen to owners of performance stallions is the ability to have their horse participate in the breeding season and still maintain an active show schedule. A great example of this balancing act is the popular NA/WPN stallion Popeye K (Voltaire/Ronald). Popeye K was the 2004 Green Conformation Hunter Horse of the year and at the time of this writing is second in the Regular Conformation Hunter Horse of the Year competition. *continued on page 6*



News

Select Breeders Southern California

Paul Loomis, MS, founder of Select Breeders Service and Dr. Ed Squires, Ph.D have partnered to launch our newest venture, Select Breeders Southern California, dedicated to bringing state of the art freezing technology, world class service and international distribution services to breeders in Central and Southern California and Arizona. SBSC provides a convenient service to the region with a completely mobile facility, managed by Chris Wilson, MS (Reproductive Physiology, Colorado State University) and outfitted with the latest controlled rate cell-freezing and computerized semen analysis equipment. SBSC has also developed relationships with several EU approved facilities in the area for freezing semen intended for export.

For more information, please contact Paul Loomis, Managing Partner (877) 658-3328 or email info@selectbreeders.com



Southern California Mobile Freezing Laboratory

Texas Breeders Forum

January 20-21, 2006

The highly popular Texas Breeders Forum will again be presented by Select Breeders Southwest in Aubrey, Texas. This 2-day event is open to veterinarians and lay people interested in all phases of equine breeding.



Wet labs on January 20 will include sessions on: equine semen collection, troubleshooting behavior problems occurring during collections, cooled semen updates, video endoscope breeding, centrifugation of equine semen and a primer on equine frozen semen.

Lectures on January 21 include: stallion behavior, lighting effects on sperm production, cloning, sex selection prior to breeding, managing a frozen semen program, and comparison of cooled and frozen semen fertility.

For registration and content information: please call Erin Bishop at Select Breeders Southwest (940) 365-2467.

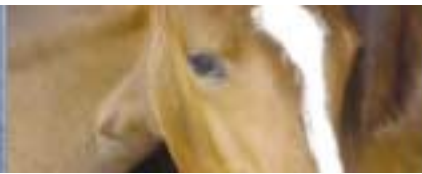
Select Breeders Southwest Facility Expansion

New Stallion Barn meets the needs of the ever growing frozen semen market.

Select Breeders Southwest recently completed a 4,640 square foot addition to their facility complex. This new building houses 8 12' x 16' stalls, conference room, reception area and office. Two new stallion turnout paddocks were also added.

The popularity of Quarter Horse frozen semen in Europe, Australia, and New Zealand make it especially important to have the new facility conform to all regulations necessary to export to these areas. The USDA was especially helpful in reviewing plans prior to construction.





Review

4th International Symposium on Stallion Reproduction

Review by Dr. Ed Squires, Ph.D, ACT (hon)
continued from page 1

Jan Roser from UC Davis, California provided results from recent studies that described the role of LH, growth hormone, testosterone and estradiol in initiating puberty. Genetic markers for stallion fertility were discussed by Leeb and co-workers from Hannover. They identified two genes associated with testicular descent and at least three genes controlling seminal plasma proteins. Based on human and mice studies there are 200 genes that affect male fertility. There were two presentations on tests that could be used to evaluate sperm quality. Love (Texas) described the clinical application of the Sperm Chromatin Structure Assay (SCSA). With cooled semen, as the amount of seminal plasma increases there is an increased denaturation of DNA. Also with subfertile stallions, DNA denaturation is higher. Neild from Holland discussed some of the other assays used for detecting capacitation and acrosome function. The chemical merocyanine 540 was shown to be accurate in detecting capacitation whereas the fluoro-chrome FITC-PNA is of value in assessing the acrosome status. All of these tests are best done using a flow cytometer which usually is only found at universities.

Equine Frozen Semen Field Results from 1985 to 2005 were presented by Vidament of the French National Stud. She described the changes in procedures for freezing, thawing, inseminating that have been made during this time. She concluded that low glycerol concentration (2.5% or less) and adequate number of sperm available per season for each mare were important factors in improving fertility.

Seminal plasma has been suggested

as being involved in sperm transport and modulating sperm induced inflammation. Troedsson from the University of Florida was asked to give the keynote address in this subject but other short abstracts were also presented. This focus reinforced the interest in determining the role of seminal plasma in fertility. Troedsson demonstrated that seminal plasma plays an active role in transport and survival of viable sperm and elimination of non-viable sperm.

Several talks were given on the use of alternative cryoprotectants to glycerol for freezing semen. Scientists from Brazil have shown a beneficial effect of using dimethyl formamide instead of glycerol. This cryoprotectant was particularly useful for some of their native breeds that have poor quality semen after freezing and thawing. In 40 of 55 stallions DMF provided higher motility post-thaw than glycerol.

In the section on stallion management, Dr. Sue McDonnell from the U. of Pennsylvania discussed aversive conditioning of periodic spontaneous erection. This is typically described as masturbation by the stallion manager and occurs normally at approximately 90 minute intervals. This behavior has traditionally been misunderstood by horsemen and various methods have been used to eliminate it by punishing the stallion. However, McDonnell demonstrated that no method effectively suppressed this behavior and that aversive conditioning with electric shock adversely affected sexual behavior and seminal characteristics.

Integrating biotechnologies in the Equine Industry was the last presentation of the meeting. The focus was on semen technologies that have been

2005 ISSR Presentations

- Puberty & Spermatogenesis
- Genomics
- AI Strategies
- Assessment of Semen Quality
- Preservation of Fresh & Cooled/Transported Semen
- Stallion Management
- Cryopreservation of Stallion Semen
- Assisted Biotechnologies
- Role of Sperm & Seminal Plasma in the Female Genital Tract
- Future Aspects. of Stallion Reproduction

Workshops:

- Prediction of Stallion Fertility
- How to Inseminate the Problem Mare
- Clinical Aspects of Stallion Fertility
- Advances in Frozen Semen Technologies

developed or are in the process of being developed. The use of fluorescent dyes and flow cytometry has become valuable as part of breeding soundness exams for stallions. Low dose insemination of fresh, cooled or frozen semen is a technology that will change the way mares are inseminated and the number of sperm used to inseminate mares. Techniques used to modify sperm plasma membranes such as feeding Omega 3 fatty acids or adding cholesterol to extenders have the potential to improve fertility of frozen/thawed sperm. Intracytoplasmic Sperm Injection (ICSI) has been used at several universities for producing foals from stallions with low sperm numbers or from stallions that have died and only a limited quantity of frozen semen is available. It is likely that before the next stallion symposium more advanced techniques will be developed that can be used to improve the success of fertility of stallion sperm.



Selecting an Embryo Transfer Facility

Dr. Phil Matthews,
Managing Partner
Peterson and Smith Equine
Reproduction Center
Ocala, FL

To talk about embryo transfer (ET) seems almost like old news to many horse breeders today. The equine part of this science was perfected in the late 1970's and started to take off commercially in the mid 1980's. Today most breed registries accept ET, and a few even allow multiple foals from the same mare to be registered in a single year. This has resulted in more and more breeders incorporating ET into their program.

A quick review of why people choose ET may be of interest. The mare that is still in performance is a wonderful candidate in that her genetics can be capitalized upon without taking her from her training/show schedule. Another category of mares that are excellent ET candidates are those that are unable to carry foals to term due to infirmities, such as laminitis. An additional situation for breeders to utilize ET is for the mare that has reproductive issues. Many of these mares are capable of conceiving but not carrying a foal to term. This may include mares with a torn cervix, a poor uterine biopsy grade or severe chronic endometritis. Finally there are those broodmares that have such valuable genetics that giving them the capacity to pro-

duce multiple foals simply makes good economic sense.

Just as many breeders have become familiar with the advantages of ET, many veterinarians have become familiar with the science. This has evolved to the degree that there are many areas of the country where veterinary practices are providing this service. In turn, it is now possible for horse owners all over the country to utilize ET without having to ship their mares to only a few select locations. In fact, with the great improvements in the science of shipping embryos, many mares don't have to travel far at all.

Commercial ET facilities that provide recipient herds are the "full service" arm of this industry. At such facilities they are able to provide the owner with a synchronized recipient, alleviating the necessity of the



Healthy, likeable and easy to handle recipient mares contribute to the success of a commercial embryo transfer program.

owner having to do so. These facilities can flush the donor and then immediately transfer the embryo in less than an hour. They also have the ability to receive embryos that are cooled and shipped to them from other parts of the country. Upon receiving the embryo they will immediately prepare a synchronized recipient mare and transfer it. With more and more of these facilities being created, what seems to set them apart? Why are some having more commercial success than

▶▶▶ Inside Look

Dr. Phil Matthews is the managing partner at Peterson and Smith Equine Reproduction Center in Ocala, Florida. Peterson and Smith has been an SBS affiliate laboratory for a number of years. In addition to their semen freezing and other reproductive work they also have a flourishing embryo transfer facility. Currently, they have over 200 mares in their recipient herd; and during the 2004 and 2005 breeding seasons achieved an 88% success rate with their transfers. (This percentage established at 21 days of gestation.)

others? The answer to these questions may help the breeder in selecting where to send the mares or shipped embryos.

Two important factors seem to separate commercial facilities in their ability to please the client. First is the success rate in transferring embryos. Success is determined by a healthy pregnancy being established which eventually results in a foal being carried to term. Success rates are determined by several factors. The reproductive health of the recipient is critical as is her synchronization with the donor mare. The technique utilized in flushing the mare as well as handling the embryo is important. Finally, the actual transfer of that embryo is very important. The



Breeding Manager's Forum

► ET Facilities Continued

technique employed in this part of the process is as much art as it is science. Success rates are made or destroyed at this juncture.

Another factor that seems to have critical emphasis on the popularity of a facility is the quality of the recipient mares. Above it was mentioned that their reproductive health is critical but in addition to that, their temperament and "likeability" is also very important. A horse breeder's elation over a successful transfer can be all but extinguished by having to deal with the "recipient mare from hell". Mares that can't be caught, or their feet can't be trimmed, or they're ornery toward other mares and people or, worst of all, don't nurture their foal, make for unhappy clients. Therefore, those facilities that provide the client with mares that are reasonably well broke and have decent temperaments will flourish over the facilities that don't.

A horse owner that is considering ET for the first time should consider and explore these two factors. How successful have they been with their transfers and how well do clients get along with the recipient mares they bring home? The breeder that has been discouraged by a past bad experience should realize that facilities differ in these two areas and rather than blame ET in general, seek out the facility that can better satisfy their desires.



Success

2005 embryo transfer foals by Paladijn out of Alena. Mare was bred with frozen semen.

Breeder: Oak Lane Farm

Frozen semen breeding & embryo transfer by Peterson & Smith Equine Reproduction Center, Ocala Florida.



Attention Breeders & Veterinarians Managing Friesian Mares

With the rise in popularity of Friesian horses in the US, it becomes increasingly important to bring to the attention of breeders and veterinarians certain reproductive characteristics peculiar to the breed. We asked Dr. Tom Stout at The University of Utrecht to share some insights gained from years of experience managing Friesian mares in their native environment. SBS Maryland included the following information in each of the Friesian frozen semen shipments made during the 2005 breeding season.



Iron Spring Farm Friesian foal. www.ironspringfarm.com

Comments from Dr. Tom Stout

"Our experience is that Friesians do everything slower, tend to have a longer oestrus and do develop much larger follicles. As with other breeds, it is difficult to set hard-and-fast rules, but we don't get many Friesians that ovulate follicles much less than 45mm (and rarely under 40mm). Their follicles can develop to 60mm before ovulation - without anything abnormal going on.

The other thing that we commonly see is that the development and reduction of oedema is much slower and more pronounced - i.e. I rarely inseminate Friesian mares with a lot of uterine oedema but rather wait until the oedema is going (they normally ovulate 1-2 days after the oedema starts decreasing). If the problem is shipment of semen with a distance of more than a day, then I would still wait for a 45mm follicle and very good uterine oedema and give hCG. If you are used to warmbloods/thoroughbreds, it is difficult to make yourself wait long enough with the Friesians before inseminating.

I advise most of our students that if they don't have any experience with Friesians they should delay insemination until they really don't dare wait any longer - and then wait one more day!"



For the full article visit the Knowledge Library at www.selectbreeders.com



05 Filly by Zip Me Impressive

Breeder:
Saddlebrook Appaloosas

Freezing Lab:
Select Breeders Southwest



05 Filly by Summers Chico Bandito

o/o Catch My Speed

Breeder:
Troy & Kim McKinney

Freezing Lab:
Select Breeders Southwest



Winston MF 05 Colt by Werbellin Hanoverian

Breeder:
Marydell Farms, North Carolina

Freezing Lab:
Select Breeders Service, Inc. (Maryland)

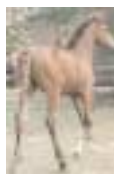


Popeye K

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Popeye spends approximately 24 weeks a year away from his home base in Virginia, including 3 months in Florida. With this kind of schedule, breeding exclusively with frozen semen was a logical decision for Spencer Ranch owners Elizabeth and Rachel Spencer.

During the 2005 breeding season, SBS Maryland distributed frozen semen to 50 mares. Of those for whom we have fertility data (43 mares) Popeye's conception rate was 80%.



.....
2005 Popeye K foal

According to Rachel Spencer, "Without the ability of frozen semen and Select Breeders Service's efficient distribution system, Popeye couldn't breed as many mares as he does and still compete as often and successfully as he does. Frozen semen provides flexibility to the mare owner and doesn't depend on our stallion's availability on a certain date. It's a great arrangement for our breeders and for Spencer Ranch."



See more frozen semen foal photos online at www.selectbreeders.com



Planning a breeding for your mare? Search stallions at www.siredirectory.com



PostThaws

All SBS laboratories are experienced in the import & export of frozen semen. Below are some of many happy results!

For more information about the Import & Export of frozen semen visit www.selectbreeders.com

05 Filly by Conquistador Whiz (QH)

o/o Lady Dun Glo

Breeder:

Andre Vanderheyden,
Belgium

Freezing Lab:

Select Breeders
Southwest



05 Colt by Rousseau

o/o Venezia

Breeder:

Trevelyan Farm,
Pennsylvania

Freezing Lab:

SBS Northgermany

Semen Importing Lab:

Select Breeders
Service, Inc. (Maryland)

05 Filly by Blazing Hot

o/o Investet

Breeder:

Thomas & Karin
Mossmann

Freezing Lab:

Select Breeders Southwest

Semen Importing Lab:

Equine Services
Germany



Dante's Dream MF 05 Colt by Don Principe

Westfalen

via Embryo Transfer

Breeder:

Marydell Farms,
North Carolina

Freezing Lab:

SBS Northgermany

Semen Importing Lab:

Select Breeders
Service, Inc. (Maryland)

05 Filly by Conquistador Whiz (QH)

o/o Do N Rosalee

Breeder:

Andre Vanderheyden,
Belgium

Freezing Lab:

Select Breeders
Southwest



05 Filly by Zips Chocolate Chip (QH)

o/o Snicker Quicker

Breeder:

Bart & Gerda Huizinga
The Netherlands

Freezing Lab:

Select Breeders
Southwest

Survival

..... How Long Does Frozen Semen Last?

One of the most frequently asked questions by potential users of frozen semen is "how long does frozen semen last?" If the semen is stored properly, it can maintain its viability for many years. Although no one knows the ultimate lifespan of properly frozen and stored equine semen, theoretically, sperm should remain viable virtually indefinitely. The key is that the semen must be properly stored if the spermatozoa are to maintain their viability.

At each of the Select Breeders Affiliate Labs, frozen semen is stored immersed in liquid nitrogen at -196°C (-320°F). Each tank is physically inspected once a week to ensure the proper level of liquid nitrogen. A detailed log is maintained on each tank.



2005 Colt by Abdullah
semen used was frozen in storage with SBS for 16 years



2004 Colt by Roemer
semen used was frozen in storage with SBS for 15 years

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1088 Nesbitt Road
Colora, MD 21917
selectbreeders.com

