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# *SAMSON* STALLION FERTILITY DIAGNOSTIC DEVICE ACCURATELY PREDICTED PREGNANCY IN MARES IN FIELD TRIAL

**Highlights:**

- **Field trial data demonstrates the pregnancy predictive power of the SAMSON technology**
  - **Standardbreds (trotters): predictive accuracy of 90% (when using the same pregnancy prediction algorithm across all stallions)**
  - **Thoroughbreds: predictive accuracy of 80-90% (when algorithm optimised for individual stallions)**
  - **Samson pregnancy predictions available within an hour of mare insemination.**
- **Memphasys to now develop integrated production prototypes of the SAMSON device for field testing in the 2022 Australian breeding season to validate the predictive algorithm on a new population of Standardbreds and Thoroughbreds**

Australian-based bio-separations and reproductive biotechnology company Memphasys Limited (ASX: MEM) is pleased to announce field trial data demonstrates the accuracy of the novel SAMSON stallion fertility diagnostic device in predicting pregnancy of the inseminated mare. The SAMSON device is one of a portfolio of innovative products that Memphasys is developing for the fertility industry.

Over the past 18 months, Memphasys has been developing the SAMSON device and has undertaken field trials on its ability to predict the chance of a pregnancy within an hour of a stallion-mare coupling, whether naturally or by artificial insemination (AI). Thoroughbreds can only be legally bred using natural mating, not using AI, whereas other horses such as Standardbreds can use AI.

Pregnancy in the mare cannot be ascertained until 14 days after coupling, by which time the mare may have missed her chance of pregnancy in the current oestrus cycle. Use of the Samson diagnostic could dramatically increase the overall mare pregnancy rates within the season.

The SAMSON device was field trialled at a major thoroughbred and a major standardbred stud farm, both in NSW, during the Sep-to-Nov 2021 Australian horse breeding season. The study was run by the University of Newcastle Reproductive Science department, led by Professor John Aitken.

The field trial demonstrated the ability of SAMSON to provide accurate on-site pregnancy predictions, provided that a reasonable quality sample of the stallion ejaculate was collected.

High quality collections can routinely be achieved in Standardbreds where all the ejaculate is first collected artificially before being used with AI to inseminate the mares. However, the dismount sample collected from Thoroughbreds after natural mating is of poorer quality as it represents the end fraction of the ejaculate, which contains less and poorer quality sperm.

The SAMSON device enables good semen parameters to be measured but it must also be supplemented with an algorithm utilising other data, such as stallion age, to provide a predictive outcome.

For Standardbred horses, using the same algorithm for all stallions, a pregnancy prediction accuracy of over 90% was achieved in the field trial.

For Thoroughbred stallions, the analysis generated a predictive accuracy of 75% when all stallions' data was combined. The lower predictive accuracy is due to the poorer quality of the Thoroughbred dismount sample compared with the Standardbred AI sample. However, pregnancy prediction accuracy was improved to 80-90% for Thoroughbred stallions when the SAMSON algorithm was optimised for each stallion by determining which variables are best used for each stallion to improve pregnancy prediction accuracy. Over time, a stallion's fertility data could be aggregated to further improve the algorithm and its predictive capability.

The potential commercial opportunities of a device that may accurately predict pregnancy in the horse breeding sector include:

- A large addressable market:
    - Major breeding activities exist in USA, Australia, Japan, Ireland, NZ and other countries
    - There are many thousands of attempted fertilisations (natural and AI) every year
- Need for improvements in fertility assessments to bolster mare pregnancy:
    - Stallion fertility can vary significantly over the breeding season, with weekly conception rates varying from 33% to 100%, with an average of 60%; some stallions have habitually poor fertility of <50%
    - Timely pregnancy prediction can help ensure that fertilisation occurs within the mare's short oestrus cycle, thereby increasing the possibility of an early pregnancy and for her improved likelihood of pregnancy during the season.
- Willingness to pay
    - Service fees, paid on successful fertilisation can be as high as $200,000
    - Achieving mare pregnancy during the season, especially an early pregnancy, is highly valued

As a by-product of the SAMSON device development, an accurate means of assessing total motile sperm count from a 0.5ml semen sample was also developed and validated for horses. The field trial data supports the potential diagnostic benefits of this device in the rapid assessment of semen quality in horses and possibly other valuable farm animals bred using AI such as cattle, sheep and pigs. In an unexpected development, the same method of determining total motile sperm count for stallions was also found to be applicable to human semen. Memphasys is undertaking market research on the feasibility of developing such total motile sperm count diagnostic devices.

**Next steps**

Memphasys is now proceeding to develop an integrated production SAMSON device for further field testing in the 2022 Australian breeding season to validate the SAMSON prediction algorithm on a new population of Standardbred and Thoroughbred horses. After validation is achieved, design and

manufacturing will be fine-tuned in preparation for the devices to be sold. No regulatory approvals are required before the SAMSON device can be commercially sold.

Memphasys also plans to test a modified SAMSON device with bulls to determine if a similar pregnancy prediction capability could be developed for high value AI-bred dairy and beef cattle.

**This announcement has been approved for release by the board of Memphasys Limited.**

**ENDS**

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**About Memphasys:**

Memphasys Limited **(ASX: MEM)** specialises in biological separations and reproductive biotechnology for high value commercial applications.

Reproductive biotechnology products in development include medical devices, in vitro diagnostics, and new proprietary media.

The Company's patented bio-separation technology, utilised by the Company's most advanced product, the Felix™ device, combines electrophoresis with proprietary size exclusion membranes to separate the most viable sperm cells for human artificial reproduction.

Website: www.memphasys.com