

DEVELOPMENT PROGRESS OF REPRODUCTIVE BIOTECHNOLOGY PRODUCT PORTFOLIO***STALLION DISMOUNT DIAGNOSTIC MOVES TO PROTOTYPE DEVELOPMENT*****Highlights**

- **Development of portfolio of novel reproductive biotechnology products¹ with Professor John Aitken's research team at University of Newcastle progressing**
- **The product portfolio is focused on reproduction in both humans and animals and ranges from prospective novel medical devices and *in vitro* diagnostics to new, proprietary media.**
- **All products have passed initial feasibility reviews of commercial opportunity and technical development capability**
- **The most advanced product, a Stallion Dismount Diagnostic, having completed proof of concept, is now progressing to prototype development phase**
- **Commercialisation of the Felix device remains MEM's primary focus**

Memphasys Limited (ASX: MEM) ("Memphasys" or "the Company") is pleased to provide an update on the progress that is being made on its portfolio of assisted reproductive biotechnology products which are being developed in conjunction with global reproductive biology expert, Professor John Aitken, and his research team at University of Newcastle.

A unique opportunity is now available to Memphasys to develop such a potentially high value portfolio of products in the reproductive biotechnology field and as a result, Memphasys is expanding its focus into reproductive biotechnology as well as bioseparations. Memphasys is utilising Professor John Aitken's vast knowledge and experience in this field, his oversight on all of the projects and the highly credentialed team he has recruited and trained at the University of Newcastle.

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With initial technical feasibility studies on these projects to establish operational and economic viability completed, Memphasys has determined that the Stallion Fertility Test (at dismount) is to be the first of the products to be progressed to the next development stage. A prototype diagnostic product, now being developed, is planned to be field tested during the race horse breeding season starting in September 2021 in Australia.

The stallion dismount diagnostic will be a rapid and easily applied *in vitro* test used at the breeding shed to detect the probability of the stallion being able to fertilise a mare based on the level of mitochondrial activity in the spermatozoa. The result would be known almost instantly following mating using a very small dismount semen sample.

¹ Prospective products in the portfolio were described in the Company's announcement dated 17th August 2020

The test is based on the fact that equine spermatozoa are highly dependent on their mitochondria to generate the energy needed for motility and fertilisation of the egg. Since the spermatozoa of other ungulate species (cattle, pigs and sheep) have a similar pattern of metabolism, Professor Aitken and his research team are confident that this diagnostic system will also permit the rapid assessment of semen quality in other commercially valuable domestic species.

Australian thoroughbred market

The Australian thoroughbred industry is a world leader, second only to America in terms of the thoroughbred horse population². The number of mares (20,400) and stallions (580) in Australia dwarfs that in other established breeding countries including the UK, Ireland, Japan and New Zealand. Australian prizemoney has soared by 84% in the last 10 years, compared to 54% in the UK and -4% in the USA, with over 60 races worth \$1 million or greater, including the \$15 million “The Everest” which is the richest race in the world on turf. Australia has produced a number of world renowned race horses competing both domestically and internationally³. More than 20,000 matings occur throughout Australia each season, resulting in some 13,000 foals⁴.

All thoroughbred horses bred for racing must be generated by natural cover, not artificial insemination. Stallions are selected on the basis of pedigree and athletic prowess rather than reproductive performance, and as a result, the average 60% conception success of these animals is lower than most domesticated livestock species. There is also a high variability of success ranging between 33% and 100%. High variability often occurs even with the same stallion at different times.

Currently, the earliest that pregnancy can be diagnosed is via ultrasonography at day 14 post natural cover.

A rapid and accurate test applied at the time of conception would be valuable to determine the chance of pregnancy success and mitigate economic loss. Such loss occurs by having to bring the mare or stallion back later for a further service, especially so if the mare’s oestrus has been missed. The goal for breeders is to secure conceptions and ongoing viable pregnancies as close as possible to the start of the breeding season on 1 September. Each additional “day of age” is worth more than US\$163 in overall benefit costs to the owner of the weanling, with an overall difference of US\$23,000 between the oldest (“early season” conception) and youngest (“late season” conception) weanlings in a sale⁵

Service fees vary from approximately A\$3,000 to A\$250,000 for a top stallion but are not payable until the mare’s pregnancy is confirmed.

It is important to note that commercialisation of the Felix device remains the key focus for Memphasys. Memphasys remains excited about the commercial prospects for this device and is actively engaged in expediting supplies of the improved modified device for the remaining verification and validation testing and for getting ready to send these devices to Memphasys’ global Key Opinion Leaders “KOLs”, who have been keen to test these modified devices.

² Website of Thoroughbred Breeders Australia: www.tbaus.com

³ Website of Thoroughbred Breeders Australia: www.tbaus.com

⁴ Website of Aushorse, the marketing body of the Australian thoroughbred industry: www.aushorse.com.au

⁵ Hansen CR, Stowe CJ. Journal of Applied Economics 2018; 50: 48-63

Memphasys Executive Chairman Ms Alison Coutts said:

"I am extremely encouraged by the progress both Memphasys and Newcastle University have made in relation to all the products under development, but especially the stallion dismount diagnostic.

"Importantly, it highlights that while bringing our Felix device for humans into commercialisation is priority, we are not a one product company reliant on a single revenue stream.

"We are now moving to prototype development for this product to test and prove the design. Simultaneously, we will also be continuing technical feasibility studies for the other products.

"If successfully commercialised, these niche products may provide significant additional revenue streams in addition to the Felix device.

"I, along with the rest of the Company look forward to continuing our work with Professor Aitken and his team to potentially progress these initiatives to commercialisation."

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

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About Memphasys:

Memphasys Limited (**ASX: MEM**) specialises in biological separations and reproductive biology for high value commercial applications. The Company's patented membrane processes in combination with electrophoresis, the application of an electrical potential difference across a fluid, enable the separation of high value substances or contaminants from the fluid in which they are contained.

The main application of the technology is the separation of the most viable sperm cells for artificial reproduction, most particularly for human IVF.

Website: www.memphasys.com