

## SRF VACATION SCHOLARSHIP REPORT 2016



<b>Student's Name:</b>	Alexander Brown	<b>Student's Institution/University:</b>	Oxford Brookes University
<b>Degree Title and year of study:</b>	Equine Science and Thoroughbred Management		
<b>Supervisor's Name:</b>	Jane Morrel	<b>Supervisor's Department and Institution:</b>	Swedish Agricultural University
<b>Project Title:</b>	Investigation of sperm mitochondrial membrane potential and reactive oxygen species production in SLC-selected stallion sperm samples		

### **Briefly outline the background and aims of the project** (*max 200 words*)

Flow Cytometry is a useful tool when assessing the quality of equine semen in the laboratory e.g. using assays for viability and reactive oxygen species (ROS) production. Research in other species suggests that mitochondrial membrane potential (MMP) could be another parameter for measuring semen quality but this assay is not used regularly when evaluating fresh stallion semen. My study had two test groups, the first being a control and other being the experimental group, which was selected by single layer centrifugation through the colloid Equicoll. Other research has shown that this method selects robust sperm cells that are capable of fertilization up to 96 hours after semen collection, so this study will run tests on motility, viability, ROS production and on MMP every 24 hours from hour 0 to 96 hours in both control and SLC samples. The aim of the study is to build on previous research by using an assay for the simultaneous measurement of ROS production and MMP in the same aliquot.

### **Did the project change from that proposed in the application? If so, what changes were made and why?** (*max 100 words*)

The number of stallions was due to be 8 but because of availability issues only 7 were available to get the 21 collections from. The 3<sup>rd</sup> collection from 3 of the stallions was only tested up to 48 hours as I had to fly home before the 96 hours were completed.

### **What were the main results/findings of the project?** (*max 300 words*)

The variation between stallions was large and there were also differences between ejaculates. The main findings were that there was a significant difference ( $P < 0.5$ ) between the control and the experimental group for viability and progressive motility for all stallions at 96 hours. The main difference between control and SLC samples occurred between the 24 hour and 48 hour measurements with a much steeper rate of decline in both progressive motility and viability in the control group compared to the experimental group. These are the results I have so far; the ROS and MMP results are still being analysed by my supervisors at SLU.

### **What do you conclude from your findings?** (*max 150 words*)

I conclude that selection of equine semen by single layer centrifugation through the colloid Equicoll selects sperm that are able to stay viable and progressively motile for a longer time period. The differences seen between control results in the stallions made it difficult to compare experimental results but for each individual stallion there was a significant difference between controls and SEL-selected samples at the 96h evaluation time. This means that with this selection process fresh semen can be stored for longer without being frozen but use should be considered on a stallion by stallion basis.

**How has this experience influenced your thinking regarding your future/ongoing studies, and/or career choice? (max 150 words)**

This experience has opened my eyes to the world of research and how it can be a very challenging but rewarding career choice. Going through the application process for this scholarship also helped me prepare for a possible future in research, as most grants that are needed to fund research require a similar application process. My project was based in Sweden which is somewhere I had never been, being able to go somewhere new for 2 months and talking to PhD students while at the university helped me realize the possibility for travel in the research industry. This is very interesting to me and the whole experience has expanded my possibilities. I have now decided to write my final project on a review of current research on single layer centrifugation through the Androcoll E colloid and have decided to apply for vet school with the view of going to do a PhD afterwards.

**Please use the space below to add any other comments/thoughts about the SRF Vacation Scholarship (max 100 words)**

***Student: I think there should be more exposure of this scholarship and similar ones to university students, as I only heard about it through my Supervisor.***

***Supervisor: this is the first time that I have accepted a student with an SRF vacation scholarship. I found the application relatively easy and the decision time was rapid, making life a lot easier for the student. Since Sweden is an expensive country to live in, it was a bonus for the student to receive some help with living expenses during his project. Excellent idea!***