

Course report for the NOVA course on Sperm Quality Evaluation

The course was held 24-28th October 2022, In Real Life at The Swedish University of Agricultural Sciences (SLU), as a joint venture between NOVA (the Nordic Forestry, Veterinary and Agricultural Universities Network), and the Research School at SLU, as well as the Center for Reproductive Biology in Uppsala (CRU), and the Cells for Life and Developmental Biology platforms at SLU.

There were 20 registrants in total although three of them had to withdraw due to unforeseen events. Two participants followed on line but could not receive credits for the course as they did not attend the practical sessions. The participants were mostly studying and working in the Scandinavian or Baltic countries, thus supporting the underlying theme of NOVA, which is to present major global challenges and potential solutions in a Scandinavian context.

The course was designed to explain the concept of sperm quality, what it is and why it is needed in different situations; how it is evaluated from basic field laboratory to advanced research setting and how it is used for different species. Pitfalls in sperm quality evaluation, were discussed as well as the importance of sperm quality evaluation to both animal production and conservation initiatives (sperm banking). Lastly suggestions were made for future developments within the field. The objectives were fulfilled by a series of lectures and tutor-led practicals/demonstrations, as well as group discussion activities and student presentations. There were mandatory assignments before and after the course as well as course literature that the students were expected to read and critique. The programme and list of lecturers is shown below.

In addition to the formal education, there was ample time for student and lecturer interactions, including joint coffee breaks, and time for discussion of the day's lectures in small groups. In addition, there was a very enjoyable social activity, involving a guided tour in the vicinity of Uppsala Cathedral, to learn about the early history of the university. This was especially interesting as the guide was able to inform us of the interactions between the Scandinavian countries that were the driving forces in the development of both the Church and the Universities in Uppsala. The guided tour was followed by a highly successful dinner at Tullgarn, Uppsala, with further opportunities for networking among the participants and lecturers.

We would like to take this opportunity to thank NOVA, CRU, the Research School at SLU, and SLU itself for their active support for this course, as well as the SLU platforms Cells for Life and Developmental Biology, which exist to facilitate research collaborations and courses.



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NOVA course: Sperm Quality Evaluation

Tanngriser 1, Ulls väg 26, Uppsala

Course organiser: jane.morrell@slu.se

Programme

Monday 24th October

- 9.00 Introduction and student presentations
Coffee break
- 10.30-11.30 Participant discussion
- 11.30-12.00 Introduction to Sperm Quality Evaluation (JM)
Lunch (not included)
- 13.00-13.30 Discussion groups
- 13.30-14.15 Spermatogenesis – overview and principles of mammalian spermatogenesis (EK)
- 14.15- 14.45 Coffee break
- 14.45-15.30 Factors influencing sperm quality (EK)
- 15.30-16.15 Seminal plasma and its effects on sperm quality (MK)
- 16.15-17.00 Contamination of semen – sources and preventative actions (EK)
- 17.30 Mingle

Tuesday 25th October

- 8:30-9:15 Flow cytometry (AJ)
- 9:15-9:45 coffee break
- 9:45-10:30 Computer assisted sperm analysis (CASA) (JM)
- 10:30-11:15 Light and fluorescence microscopy (EA)
- 11:15-12:00 Fertilizing capacity: in vitro fertilization, binding assays (GVM)
Lunch (not included)
- 13.00-13.30 Discussion groups
- 13:30-14:15 Improving sperm quality by sperm selection (JM)
- 14:15- 14:45 coffee break
- 14:45-17:00 practical classes and demonstrations (KV-lab, 3rd floor)





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Wednesday 26th October

- 8:30-9:00 Human IVF and sperm quality in human assisted reproduction (LA)
- 9:00-9:30 coffee break
- 9:30-10:00 Human IVF and sperm quality in human assisted reproduction *continued* (LA)
- 10:15-11:00 Extracellular vesicles (HRM)
- 11:15-12:00 Sperm binding to junco (KP)
- Lunch (not included)
- 13:00-13:30 Group discussions
- 13:30-14:15 Avian sperm (MRA)
- 14:15-14:45 coffee break
- 14:45-17:00 practical classes and demonstrations (KV-lab, 3rd floor)

Thursday 27th October

- 8:30-9:15 Sperm quality in dairy cattle (KK)
- 9:15-9:45 coffee break
- 9:45-10:30 Sperm quality in beef cattle (TH)
- 10:30-11:15 Sperm quality in pig breeding (RMG)
- 11:15-12:00 sperm quality in dog breeding (EA)
- Lunch (not included)
- 13:00-13:30 Group discussions
- 13:30-14:15 Effect of dioxins on male fertility AG)
- 14:15-14:45 coffee break
- 14:45-17:00 practical classes and demonstrations (KV-lab, 3rd floor)
- 17:45 Social event





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Friday 28th October

08:30 -09.15 Introduction to fish reproductive physiology (IM, AS)

09:15- 09:345 Coffee break

09:45- 11:15 Sperm quality in aquaculture (IM)

11.15-12:00 Conservation breeding/genetic diversity (IM)

Lunch (not included)

13:00-13.30 Group discussion

13:30 – 16:00 Demonstrations (Semen collection hall and clinical sperm lab, house 3)

milt collection and CASA (IM, AS)

demonstration of fish embryos (SÖ)

subjective sperm motility assessment

16:00-16:30 Round-table and course evaluation

EK Elisabeth Kommissrud, Inland Norway University

MK Maria Kareskoski, University of Helsinki

EA Eva Axné, Swedish University of Agricultural Sciences (SLU)

JM Jane Morrell, SLU

AJ Anders Johannisson, SLU

GVM Griselda Valdez Magana, SLU

LA Ludvig Åhrén

KP Kushagr Punyani, SpermoSens

HRM Heriberto Rodriguez-Martinez, Linköping University

MRA Manuel Rodriguez Alvarez, INIA-CSIC, Madrid

KK Kasia Kupisiewicz, Viking Genetics, Denmark

TH Triin Hallap, Estonian University of Life Sciences

RMG Rodrigo Mezêncio Godinho, Norsvin

AG Anders Glynn, SLU

IM Ian Mayer, Norwegian University of Life Sciences

AS Amin Sayyari, Norwegian University of Life Sciences

