



# Long-term storage of liquid-preserved boar semen: A comparative study using 5 different commercial extenders

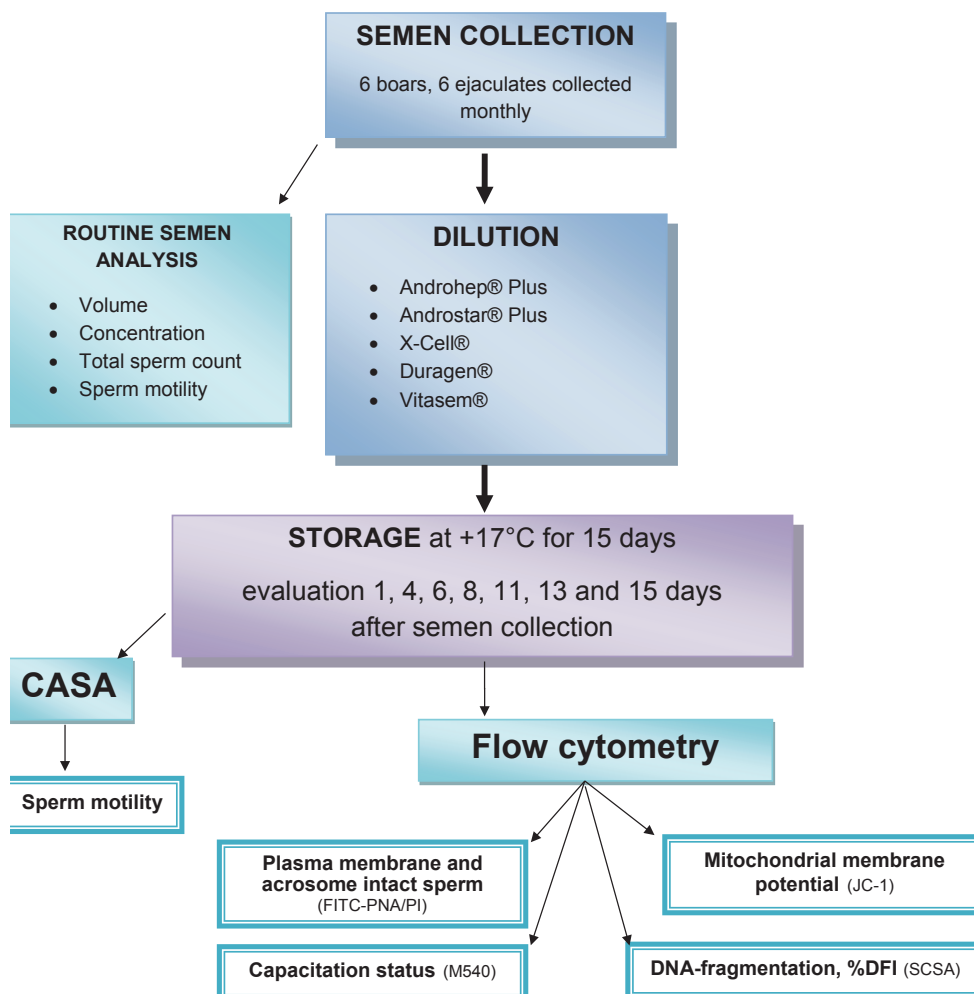
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## 1) Introduction

The aim of the present study was to evaluate the effect of long-term storage on the quality of liquid-preserved boar semen and to compare the effects of 5 different commercial long-term semen extenders.

## 2) Material and Methods

Ejaculates (n=6) obtained from 6 boars were preserved monthly from April to September in Androhep® Plus, Androstar® Plus (Minitube, Tiefenbach, Germany), Duragen®, Vitasem® (Magapor, Ejea de los Caballeros, Spain) and X-Cell® (IMV-Technologies, L'Aigle, France). The ejaculates were diluted in each of the 5 long-term extenders on site before being taken to the andrological laboratory (of the University Zürich). The extended ejaculates were stored at +17°C over a period of 15 days. The evaluation of semen quality was carried out on days 1, 4, 6, 8, 11, 13 and 15 after collection. Semen motility was examined using computer assisted sperm analysis (CASA). Flow cytometry was used to analyse acrosome and membrane integrity, mitochondrial function, capacitation status and DNA fragmentation.



### 3) Results

All semen characteristics with exception of DNA-fragmentation were influenced by the extender ( $P < 0.05$ ).

Regarding total sperm motility (Fig. 1) semen diluted with Androhep® Plus, Androstar® Plus and X-Cell® showed significant higher ( $P < 0.05$ ) values than with Duragen® or Vitasem®.

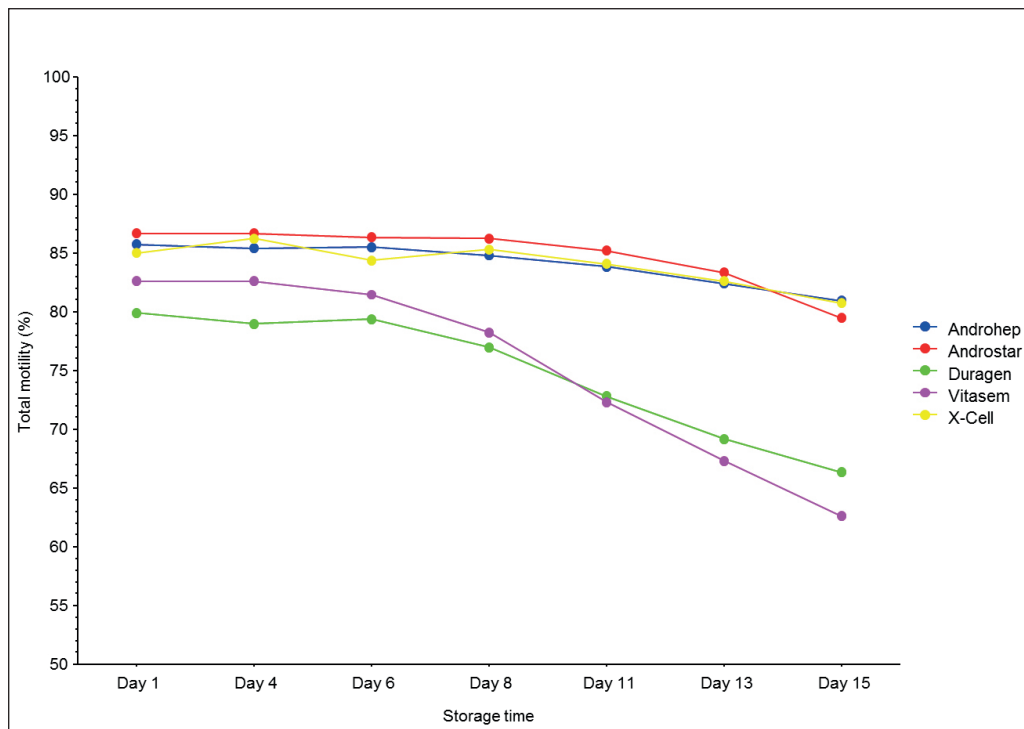


Fig. 1: Total motility of boar sperm ( $n=36$  ejaculates) diluted in 5 different extenders after a storage time of 15 days at  $+17^{\circ}\text{C}$ .

The flowcytometry analysis was used to determine acrosome and membrane integrity (FITC-PNA/PI, figure 2) and mitochondrial function (HMMP).

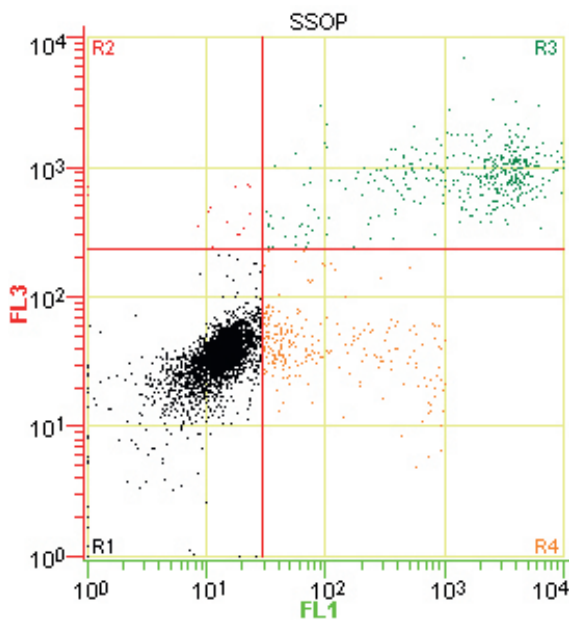


Fig. 2: Dotplot (example) of flowcytometry analysis for membrane and acrosome integrity (FITC-PNA/PI) of boar sperm

R1: intact sperm

R2: membrane defect and acrosome intact sperm

R3: membrane and acrosome defect sperm

R4: membrane intact and acrosome defect sperm

There was no statistic difference between the extenders for mitochondrial function and for acrosome and membrane integrity, except Androhep® Plus was significantly higher ( $P < 0.05$ ) than Duragen® or Vitasem® for both parameters from day 8 on.

The percentage of capacitated sperm (Fig. 3) was highest in Vitasem® (20 %;  $P < 0.05$ ) from day 8 on, and lowest in Androhep® Plus (13.5 %).

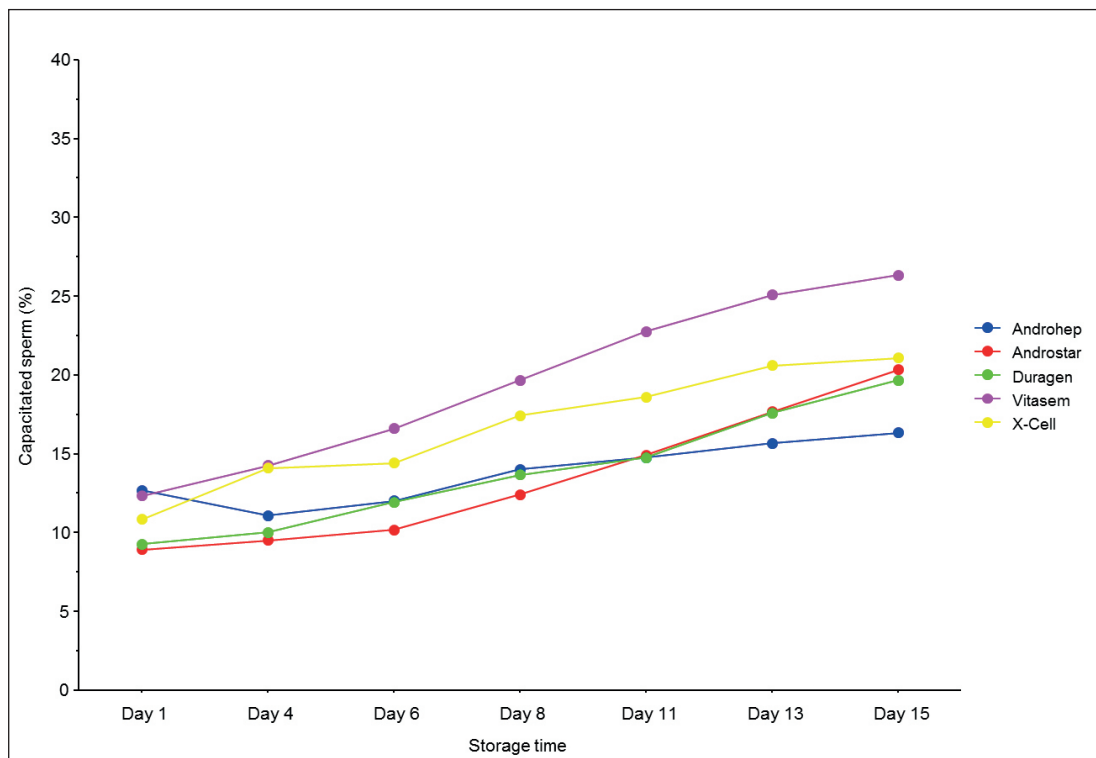


Fig. 3: Capacitated sperm (n=36 ejaculates) diluted in 5 different extenders after a storage time of 15 days at +17 °C.

## Conclusion

Androstar® Plus showed very good conservation capabilities for all parameters measured up until day 8. Semen preserved in Androhep® Plus maintained the highest quality of all extenders throughout the whole 15 days-storing period. With Vitasem® a reduction in semen quality was observed after 8 days, compared to the other extenders.

Minitube extenders performed in this trial as expected: Androhep® Plus was superior preserving especially sperm motility, membrane integrity and preventing pre-capaciation of sperm, thus providing highest values in sperm quality parameters during extremely long term storage up to day 15. Androstar® Plus, equivalent to all other extenders in all parameters measured but in the superior group for motility until day 15, can be considered an excellent extender for long term preservation until at least day 8.

## Source

Results elaborated for thesis to reach a degree of Master in Agriculture Sciences of the Technical University of Munich, Institute for Physiology Weihenstephan, by Dominika Becherer, in cooperation with the University of Zurich, Vetsuisse Faculty and Suisag Sempach, April - September 2013. Titel of the thesis: „Auswirkungen einer Langzeitlagerung mit verschiedenen Verdünnern auf die Qualität von flüssig-konserviertem Ebersperma“.