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

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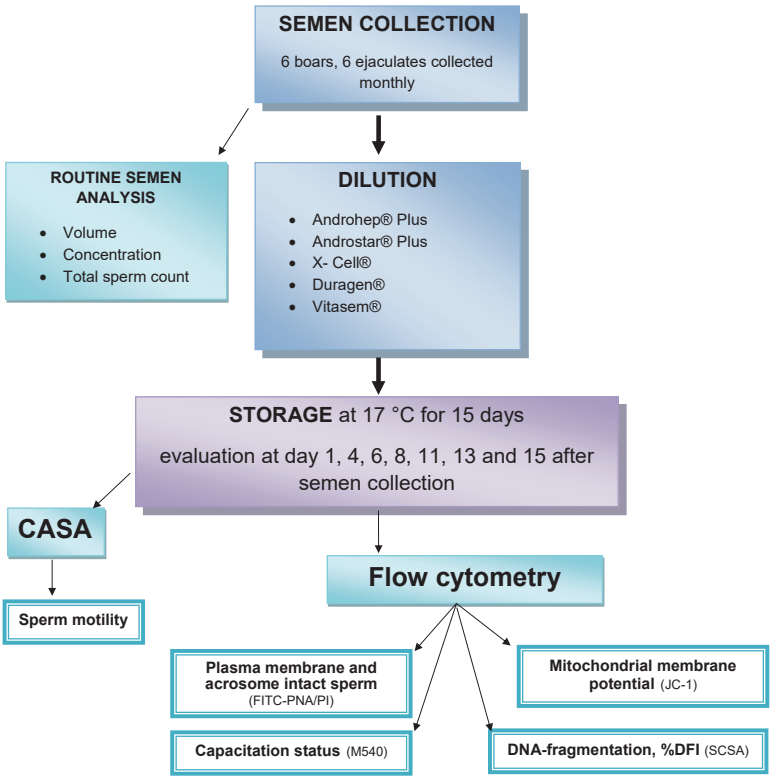
1) Introduction

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. The extended ejaculates were stored at 17° 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 (PMAI), mitochondrial function (HMMP), capacitation status and DNA fragmentation.



3) Results

All semen characteristics with exception of DNA-fragmentation were influenced by the extender ($P<0.05$). Regarding 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®. Acrosome and membrane integrity (Fig. 2) as well as mitochondrial activity (Fig. 3) were higher ($P<0.05$) using Androhep® Plus than Androstar® Plus or Vitasem®. Furthermore Androstar® Plus and X-Cell® were superior ($P<0.05$) to Duragen® or Vitasem®. Semen preserved in Androhep® Plus maintained high quality throughout the whole 15 days-storing period. Using Androstar® Plus, Duragen® and X-Cell®, a reduction in quality (motility, acrosome and membrane integrity, capacitation status) was observed after storage of 11-13 days, whereas using Vitasem® a clear reduction in semen quality was observed already after 8-11 days.

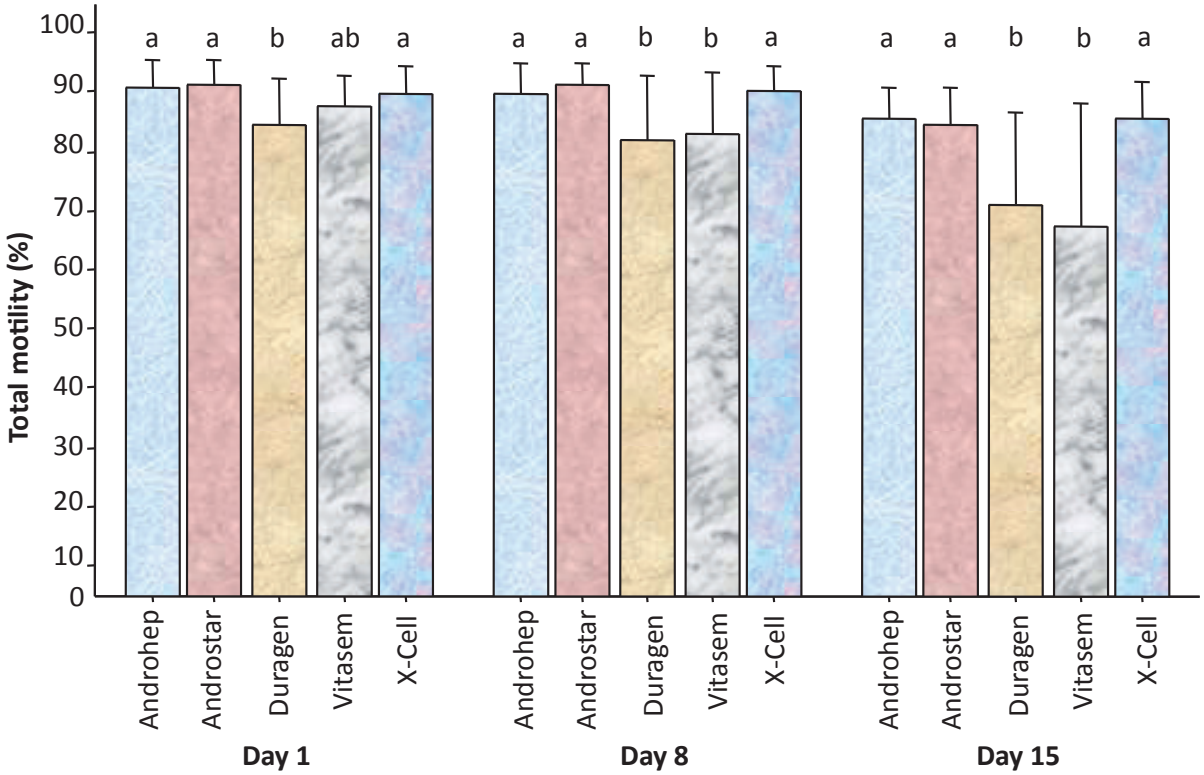


Fig. 1: Mean (±SD) of total motility of boar semen (n=36 ejaculates) diluted in 5 different extenders after a storage time of 1, 8 and 15 days at 17 °C. Bars with different letters within days indicate significant differences (P<0.05).

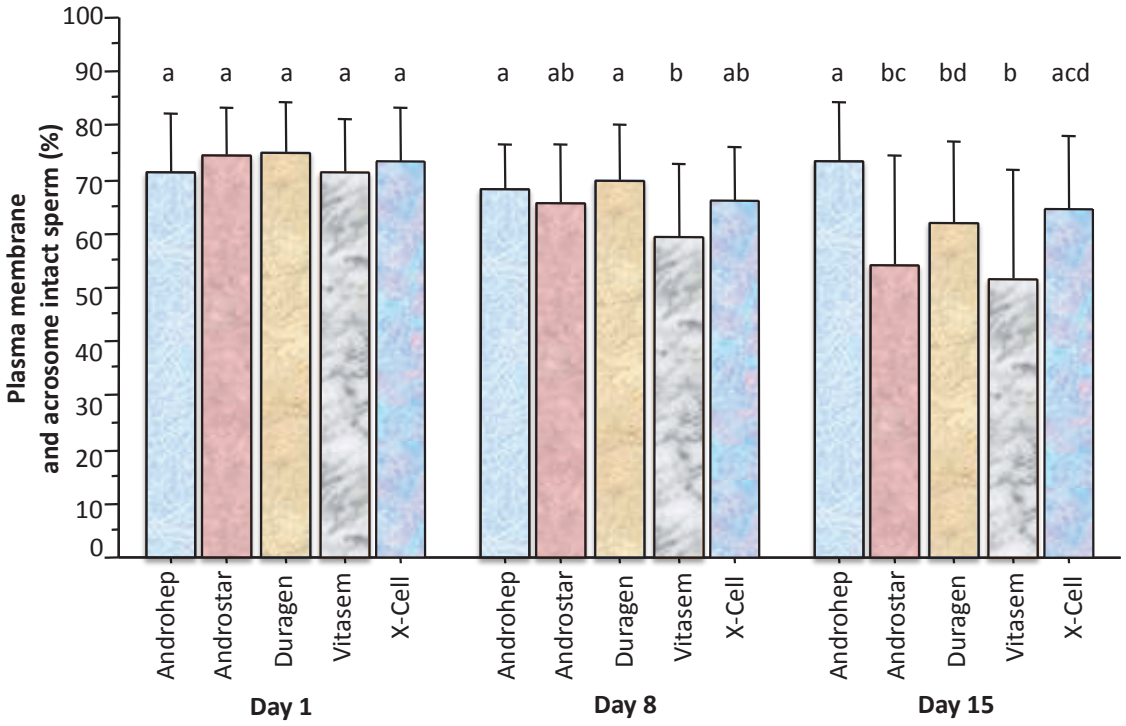


Fig. 2: Mean (±SD) of plasma membrane and acrosome intact sperm of boar semen (n=36 ejaculates) diluted in 5 different extenders after a storage time of 1, 8 and 15 days at 17 °C. Bars with different letters within days indicate significant differences (P<0.05).

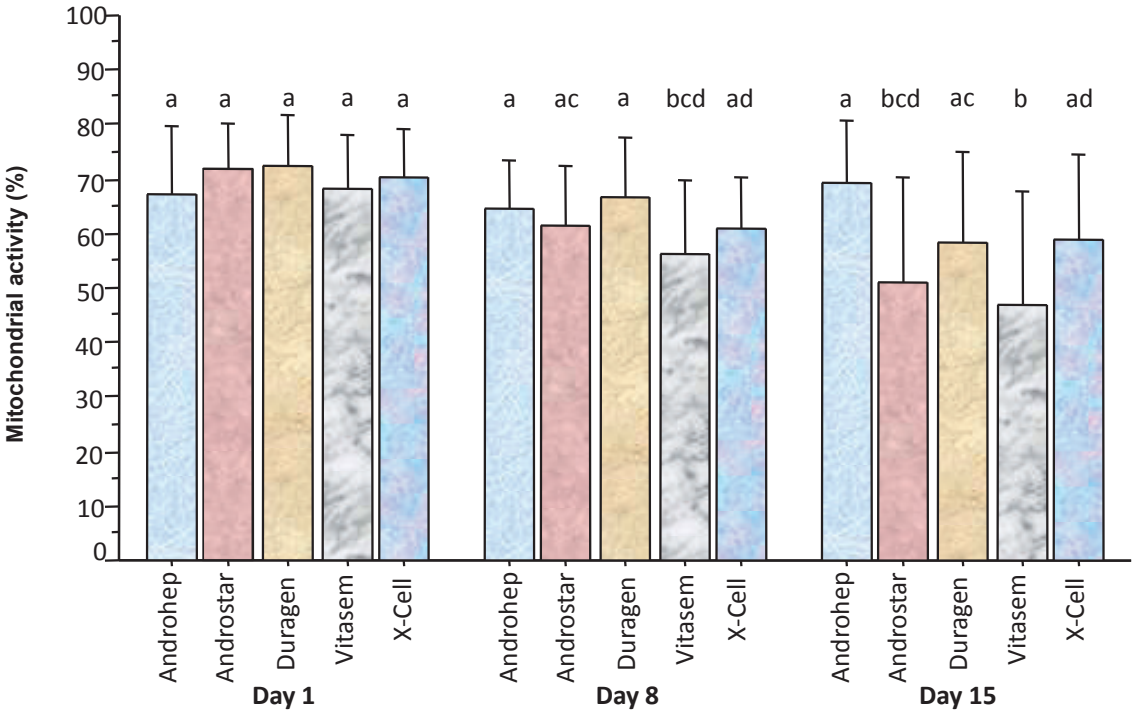


Fig. 3: Mean (±SD) of sperm with high mitochondrial membrane potential of boar semen (n=36 ejaculates) diluted in 5 different extenders after a storage time of 1, 8 and 15 days at 17 °C. Bars with different letters within days indicate significant differences (P<0.05).

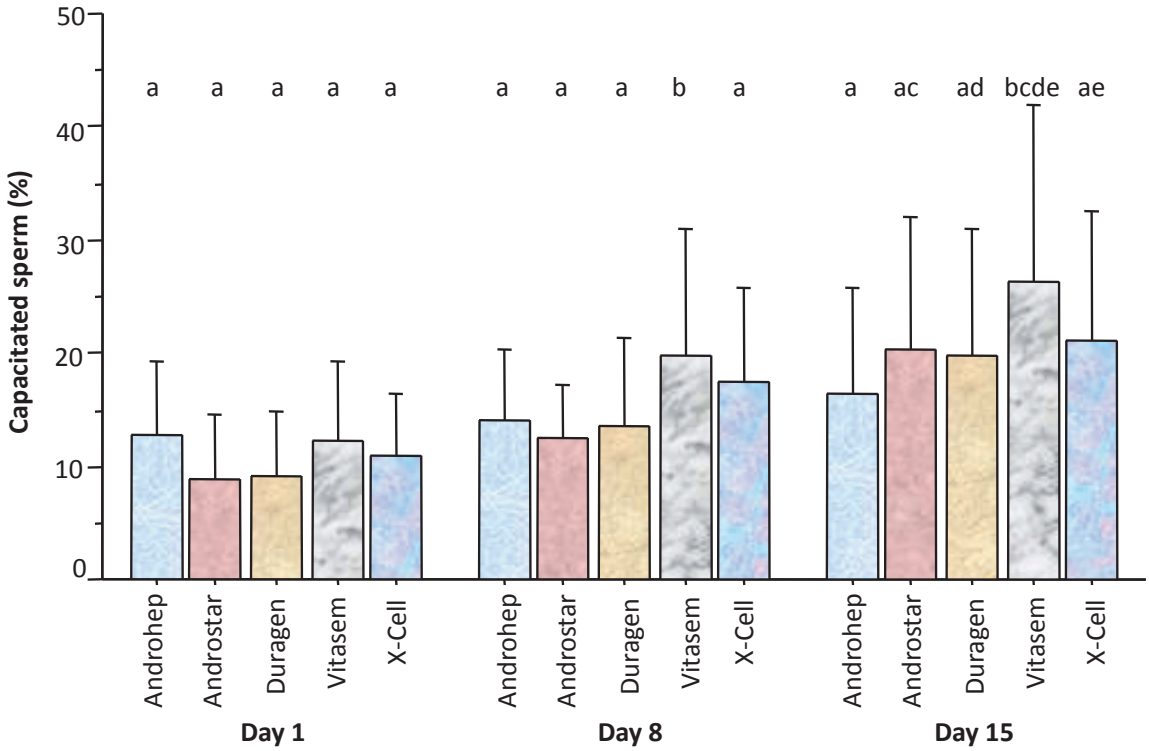


Fig. 4: Mean (±SD) of capacitated sperm of boar semen (n=36 ejaculates) diluted in 5 different extenders after a storage time of 1, 8 and 15 days at 17 °C. Bars with different letters within days indicate significant differences (P<0.05).

4) 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 Universtiy of Zurich, Vetsuisse Faculty and Suisag Sempach, April - September 2013. Titel of the thesis: „Auswirkungen einer Langzeitlagerung mit verschiedenen Verdünnern auf die Qualität von flüssigkonserviertem Ebersperma“.