

## 7 Summary

von Stern, Katharina (2001): Suitability of function tests for the prediction of the fertility of cryopreserved stallion semen

Sperm motility is an insufficient parameter to predict the fertility of stallion semen. Therefore, we examined the suitability of mucus penetration test and the determination of acrosin activity by gelatinolysis for the prediction of the semens' fertility after cryopreservation. In a preliminary trial with three stallions both methods were found to be feasible.

In the main trial we examined 25 ejaculates of 13 stallions (10 warm-blood, 2 Thoroughbred, 1 trotter; age 5-21 y). The percentage of sperms with progressive motility decreased from  $31.6 \pm 10.7\%$  in native semen to  $19.6 \pm 13.6\%$  after freezing. This difference was significant ( $p < 0.05$ ), but motility before and after freezing were not correlated.

Cryopreservation caused a decrease of penetration distance in mucus penetration test (native semen:  $48.5 \pm 20.9$  mm, diluted semen:  $55.5 \pm 19.3$  mm, frozen semen:  $35.5 \pm 31.9$  mm,  $p < 0.001$ ). The values before and after freezing showed a weak yet significant positive correlation ( $R = 0.076$ ,  $p < 0.001$ ). The percentage of forward motile sperms was only positively correlated to frozen semen.

Acrosin activity measured by gelatinolysis differed between native, diluted, and frozen semen. The percentage of spermatozoa with lytic activity was  $63.2 \pm 19.1\%$  in native semen,  $63.8 \pm 19.1\%$  in diluted semen, and  $45.3 \pm 21.9\%$  in thawed semen. There was no correlation in the pre- and post-freezing values. Only the thawed semen showed a positive correlation compared to motility. Measurements of halo diameters did not reveal correlations between pre- and post-thawed values or motility.

The measurement of penetration distance in mucus penetration test and the determination of lytic active sperms by gelatinolysis showed differences between native and frozen semen and are suitable to examine the freezing capability of stallion semen. Further tests with more stallions are desirable in order to establish minimum requirements for freezable semen.