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INFLUENCE OF EQUILIBRATION TIME AND FREEZING DILUENT ON POST-THAW MOTILITY AND ACROSOMAL INTEGRITY OF EPIDIDYMAL SPERM FROM THE AFRICAN BUFFALO (*SYNCERUS CAFFER*)

By

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Submitted in partial fulfilment of the requirements for the degree of Master of Science in the Department of Production Animal Science in the Faculty of Veterinary Science, University of Pretoria

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SUMMARY

INFLUENCE OF EQUILIBRATION TIME AND FREEZING DILUENT ON POST-THAW MOTILITY AND ACROSOMAL INTEGRITY OF EPIDIDYMAL SPERM FROM THE AFRICAN BUFFALO (*SYNCERUS CAFFER*)

By

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Co-Promoter: Prof B Colenbrander PhD
Department: Production Animal Studies
Degree: MSc

The aim of this study was to test whether or not the equilibration time of two different cryodiluents influences the post thaw qualities of epididymal African buffalo (*Syncerus caffer*) sperm. Diluents and equilibration times were compared by assessing the post thaw spermatozoal motility, longevity and the acrosomal integrity.

African buffaloes belong to Africa's "Big Five" and are, therefore, popular animals amongst game farmers, hunters and tourists. They are also asymptomatic carriers of foot-and-mouth-disease (FMD) and considered to be a wildlife reservoir for this plague. Other diseases, that are carried and can be transmitted from the African buffalo (*Syncerus caffer*) to livestock include tuberculosis, brucellosis and theileriosis or corridor disease (CD). Therefore, the transportation of African buffaloes is highly regulated. Disease-free buffalo populations are currently derived from a small genetic

pool and are smaller in their trophy size than the free-ranging animals from the diseased areas of the Kruger National Park (KNP) and the Hluhluwe/Umfolozzi National Park. Hence there is a special interest in bringing new genetic material into the disease-free populations.

Epididymal sperm from 11 mature African buffalo bulls was collected, diluted with two different semen extenders (Triladyl™ [Tris egg yolk extender] and AndroMed® [synthetic extender, i.e. fully defined medium]) and frozen. Pre-freezing equilibration times of 2 and 9 hours were tested. Total and progressive motilities, longevities and acrosomal integrity were measured and compared.

Results show that there were no differences in post-thaw sperm quality when equilibration times between 2 and 9 hr were used. The use of the egg yolk containing extender (Triladyl™) resulted in higher percentage of post-thaw motilities than the use of the synthetic AndroMed®.

Because a high percentage of progressive motile spermatozoa is one of the prerequisites for successful AI it must be concluded that Triladyl™ is superior to AndroMed®. As I believe the advantages of higher motility to be bigger than the hygiene risks of a yolk containing extender I conclude that epididymal buffalo sperm should rather be frozen with Triladyl™ than with AndroMed®.

Keywords:

African buffalo, epididymal sperm, equilibration time, egg yolk free, AndroMed, Triladyl, cryopreservation, FITC-PNA stain, longevity, buffaloes free of specific diseases

Opsomming

DIE INVLOED VAN EKWILBRASIETYD EN BEVRIESINGSVERDUNNER OP DIE BEWEEGLIKHEID EN AKROSOMALE INTEGRITEIT NA ONTDOOING VAN EPIDIDIMALE SPERMS VAN DIE AFRIKAANSE BUFFEL (*SYNCERUS CAFFER*)

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Die doel van hierdie studie was om vas te stel of die eienskappe van epididimale sperms van die Afrikaanse buffel (*Syncerus caffer*) na ontdooing beïnvloed word deur die ekwilibrasietyd en die twee verdunners waarin dit beïnvloed is. Verdunners en ekwilibrasietyd is vergelyk met betrekking tot die beweeglikheid, langlewendheid en akrosomale integriteit van die sperms na ontdooing.

Afrikaanse buffels behoort tot Afrika se "Groot vyf" en is daarom gewild onder wildboere, jagers en toeriste. Hulle is simptomevrye draers van bek-en-klouseer en word daarom beskou as die bron van hierdie plaag onder wilde diere. Afrikaanse buffels dra ook tuberkulose, brucellose en buffelsiekte na vee oor. Afrikaanse buffels mag gevolglik nie sonder 'n spesiale vervoerpermit verskuif word nie. Die genepoel van siektevrye buffels is klein. Boonop is die trofee van siektevrye buffels kleiner as dié van diere uit besmette gebiede soos die Nasionale Kruger Wildtuin en die