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CRYOPRESERVATION OF HORSE SEMEN UNDER LABORATORY AND FIELD CONDITIONS USING A STIRLING CYCLE FREEZER

K. Faszer¹, D. Draper², J.E. Green², G.J. Morris^{1*} and B.W.W. Grout²

¹Asymptote Ltd., St John's Innovation Centre, Cowley Road, Cambridge CB4 0WS, UK

²Postgraduate School, Writtle College, Chelmsford, CM1 3RR, UK

*Corresponding author, e-mail: jmorris@asymptote.co.uk

Abstract

A Stirling Cycle freezer has been developed as an alternative to conventional liquid nitrogen controlled rate freezers. Horse semen samples were cooled in 0.25 ml straws and 15 ml bags in the Stirling Cycle freezer under laboratory conditions and as a portable device, powered from a car battery. For comparison, straws were frozen in a conventional liquid nitrogen controlled rate freezer. Upon thawing, motility and viability of samples frozen in the Stirling Cycle freezer were not significantly different when compared to samples frozen in the liquid nitrogen freezer. Unlike liquid nitrogen systems, the Stirling Cycle freezer does not pose a contamination risk, can be used in sterile conditions and has no need for a constant supply of cryogen. The freezer has potential for use in veterinary and genetic conservation applications.

Keywords: Cryopreservation, liquid nitrogen-free, spermatozoa, Stirling Cycle freezer, portability, bag freezing