

embryos in vitro. *Theriogenology*. 2001; 56:503-516.

22. Makkar G , Ng HY , Yeung SB. and HO PC. Comparison of two colloidal silica-based sperm separation media with a non-silica-based medium. *Fertil. Steril.* 1999; 72:796-802.

23. Eilish T , Donnelly , Neil McClure. and Sheena EM. The effect of ascorbate and -tocopherol supplementation in vitro on DNA integrity and hydrogen peroxide-induced DNA damage in human spermatozoa. *Mutagenesis*. 1999; 14: 505-512.

24. Aitken RJ. and Clarkson JS. Cellular basis of defective sperm function and its association with the genesis of reactive oxygen species by human spermatozoa. *J. Reprod. Fertil.* 1987; 81: 459-469.

25. Anderson D , Yu TW , Phillips BJ. and Schmezer P. The effects of various antioxidants and modifying agents on oxygen-radical-generated DNA damage in human lymphocytes in the Comet assay. *Mutat. Res.* 1994; 307: 261-271.

26. Barclay LRC , Locke SJ , MacNeil JM. and Van Kessel J. Autoxidation of micelles and model membranes. Quantitative kinetic measurements made by using either water-soluble or lipid-soluble initiators with water-soluble or lipid-soluble chain-breaking antioxidants. *J. Am. Chem. Soc.* 1984; 106: 2479-2481.

27. Donnelly ET , Lewis SE , McNally J. and Thompson W. In vitro fertilization and pregnancy rates: the influence of sperm motility and morphology on IVF outcome. *Fertil. Steril.* 1998; 70: 305-314.

28. Fraga CG , Motchnik PA , Shigenaga MK , Helbock HJ , Jacob RA. and Ames BN. Ascorbic acid protects against endogenous oxidative DNA damage in human sperm. *Proc. Natl Acad. Sci.* 1991; 88: 11003-11006.

29. Geva E , Lessing JB , Bartoov B , Lerner-Geva L , Zabludovsky N. and Amit A. The effect of antioxidant treatment on human sperm and fertilization rate in vitro fertilization programme. *Fertil. Steril.* 1996; 66: 430-434.

30. Hughes CM , Lewis SE , McKelvey-Martin VJ. and Thompson W. The effects of antioxidant supplementation during percoll preparation on human sperm DNA integrity. *Hum. Reprod.* 1998; 13: 1240-1247.