

Butylated hydroxytoluene can reduce oxidative stress and improve quality of frozenthawed bull semen processed in lecithin and egg yolk based extenders

ABSTRACT

The aims of this study were to evaluate the effects of anti-oxidant butylated hydroxytoluene (BHT), when added at different concentrations into lecithin-based Bioxcell[®] (BX) and two egg-yolk-based; Tris (TY) and citrate (CE) semen extenders, on post-thaw bull sperm quality and oxidative stress. A total of 30 ejaculates from three bulls were collected using an electro ejaculator. Ejaculates were extended with one of the BX, TY and CE extenders, which contained different concentrations (0.0 – control, 0.5, 1.0, 1.5, 2.0 and 3.0 mM/ml) of BHT. The extended semen samples were chilled to 4 °C, and then frozen slowly to –196 °C in 0.25 ml straws before being stored in liquid nitrogen for 2 weeks. Results showed that supplementation of BHT improved ($P < 0.05$) general motility, progressive motility, morphology, acrosome integrity, DNA integrity and malondialdehyde of sperm at 0.5 mM/ml for BX and at 1–1.5 mM/ml of BHT for TY and CE when compared with the control. However, greater concentrations of 2.0 and 3.0 mM/ml of BHT had a detrimental ($P < 0.05$) effect compared with the control with all extenders evaluated. In conclusion, BHT supplementation at lesser concentrations (0.5–1.5 mM/ml) could improve frozen–thawed bull sperm quality by reducing oxidative stress produced during the freezing–thawing procedures in either lecithin or egg-yolk based extenders.

Keyword: Anti-oxidant; Butylated hydroxytoluene; Extender; Oxidative stress; Sperm quality