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Supplementation of the Thawing Media With Reduced Glutathione Improves Function and the In Vitro Fertilizing Ability of Boar Spermatozoa After Cryopreservation

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In this study, we evaluated the effects of glutathione (L-g-glutamyl-L-cysteinylglycine; GSH) supplementation of the thawing extender on semen parameters to compensate for the decrease in GSH content observed during sperm freezing. To fully address these questions, we used a set of functional sperm tests. These included tests of motility and motion parameters, changes in sulfhydryl group content in membrane proteins, capacitation status, measures of intra-cellular reactive oxygen species generation, sperm chromatin condensation, and in vitro penetration of immature oocytes. The main findings emerging from this study were that addition of GSH to the thawing media resulted in a lower number of capacitated viable spermatozoa, a decrease in the number of spermatozoa with changes in the sulfhydryl groups in membrane proteins, a reduction of the reactive oxygen species generation, a lower chromatin condensation, and a higher penetration ability of oocytes in vitro and a higher proportion of decondensated sperm heads. GSH appears to play an important role in sperm antioxidant defense strategy. Addition of GSH to the thawing extender could be of significant benefit in improving the function and fertilizing capacity of frozen boar spermatozoa.

Key words: Pig spermatozoa, oxidative stress, IVF, capacitation status

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