



Journal of Andrology, Vol. 26, No. 3, May/June 2005  
Copyright © [American Society of Andrology](#)  
DOI: 10.2164/jandrol.04155

# Cooling and Freezing of Boar Spermatozoa: Supplementation of the Freezing Media With Reduced Glutathione Preserves Sperm Function

JOAQUÍN GADEA<sup>\*</sup>, FRANCISCO GARCÍA-VAZQUEZ<sup>\*</sup>, CARMEN MATÁS<sup>\*</sup>,  
JUAN C. GARDÓN<sup>\*,†</sup>, SEBASTIÁN CÁNOVAS<sup>\*</sup> AND DAVID GUMBAO

*From the <sup>\*</sup> Department of Physiology, School of Veterinary, University of Murcia, Spain; and the <sup>†</sup> School of Agrarian Science, National University of Lomas de Zamora, Buenos Aires, Argentina.*

Correspondence to: Dr Joaquín Gadea, Department of Physiology, Facultad de Veterinaria, Universidad de Murcia, 30100 Murcia, Spain (e-mail: [jgadea@um.es](mailto:jgadea@um.es)).

In this study, we evaluated the effects of glutathione (L- $\gamma$ -glutamyl-L-cysteinylglycine; GSH) supplementation of the freezing extender on semen parameters during the cooling (2 hours at 5°C) and freezing phases of the cryopreservation process to compensate for the decrease in GSH content observed during sperm freezing. To fully address these questions, we incorporated a new set of functional sperm tests. These included tests of mitochondrial function, inducibility of the acrosome reaction, in vitro penetration (IVP) of oocytes, changes in sulfhydryl group content in membrane proteins, and capacitation status. The main findings emerging from this study were that the addition of GSH to the freezing media resulted in 1) an improvement in percent motility (%MOT) and motion parameters of thawed spermatozoa, as measured by both microscopic analysis and computer-assisted semen analysis (CASA); 2) a higher number of total viable spermatozoa; 3) a higher number of noncapacitated viable spermatozoa; and 4) a decrease in the number of spermatozoa with changes in the sulfhydryl groups in membrane proteins. This protective effect on sperm function was more pronounced with 1 mM of GSH than with 5 mM of GSH.

Key words: Pig spermatozoa, antioxidants, cryopreservation, in vitro fertilization, capacitation status

This article has been cited by other articles:

## This Article

- ▶ [Full Text](#)
- ▶ [Full Text \(PDF\)](#)
- ▶ [Alert me when this article is cited](#)
- ▶ [Alert me if a correction is posted](#)

## Services

- ▶ [Similar articles in this journal](#)
- ▶ [Similar articles in PubMed](#)
- ▶ [Alert me to new issues of the journal](#)
- ▶ [Download to citation manager](#)

## Citing Articles

- ▶ [Citing Articles via HighWire](#)
- ▶ [Citing Articles via Google Scholar](#)

## Google Scholar

- ▶ [Articles by Gadea, J.](#)
- ▶ [Articles by Gumbao, D.](#)
- ▶ [Search for Related Content](#)

## PubMed

- ▶ [PubMed Citation](#)
- ▶ [Articles by Gadea, J.](#)
- ▶ [Articles by Gumbao, D.](#)



J. Gadea, D. Gumbao, C. Matas, and R. Romar  
Supplementation of the Thawing Media With Reduced Glutathione  
Improves Function and the In Vitro Fertilizing Ability of Boar  
Spermatozoa After Cryopreservation

J Androl, November 1, 2005; 26(6): 749 - 756.

[\[Abstract\]](#) [\[Full Text\]](#) [\[PDF\]](#)

---

[HOME](#) [HELP](#) [FEEDBACK](#) [SUBSCRIPTIONS](#) [ARCHIVE](#) [SEARCH](#) [TABLE OF CONTENTS](#)

[Copyright © 2005 by The American Society of Andrology.](#)