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Table of Contents

VETMED 2008
VETMED 2007
VETMED 2006
VETMED 2005
VETMED 2004
VETMED 2003
VETMED 2002
VETMED 2001
VETMED Home

Editorial Board

For Authors

- Authors Declaration
- Instruction to Authors
- Guide for

Veterinarni Medicina

Effect of acrosome reaction progress in frozen-thawed boar spermatozoa on the efficiency of *in vitro* oocyte fertilization

Martecikova S, Hulinska P, Reckova Z, Pavlik A, Jeseta M, Machatkova M:

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[fulltext]

A good functional status of cryopreserved boar spermatozoa is very important for successful fertilization of porcine oocytes and *in vitro* embryo production. The purpose of the study was to evaluate the changes in functional status of boar spermatozoa separated from frozen-thawed semen and capacitated *in vitro* by caffeine. The effect of acrosome reaction development in spermatozoa on the efficiency of oocyte fertilization has been studied in boars A, B and C. Motile spermatozoa were separated by Percoll gradient, untreated (control) or treated with both 1mM and 2mM caffeine, and capacitated or co-cultured with matured oocytes. The motility, viability, chromatin

and acrosome integrity, and fertilizing ability of spermatozoa were assessed. The separation significantly increased ($P < 0.05$) the percentage of viable spermatozoa in all tested boars and percentages of motile and acrosome intact spermatozoa in boars B and C. The capacitation significantly decreased ($P < 0.05$) the percentages of viable and motile spermatozoa, but after capacitation, the motility and viability were significantly higher ($P < 0.05$) for the caffeine-treated spermatozoa than for the untreated controls. A fall in the proportion of acrosome-intact spermatozoa was different for each caffeine concentration and each boar, but in all boars, acrosome reaction progress was faster and, similarly, monospermy and the total efficiency of fertilization were significantly higher ($P < 0.01$) for the spermatozoa treated with 1mM caffeine than for those treated with 2mM caffeine. It can be concluded that there is a potential relationship between the acrosome reaction progress in frozen-thawed boar spermatozoa and the efficiency of fertilization of porcine oocytes. A faster AR induced in spermatozoa by

a higher monospermy rate and total efficiency of fertilization. Thus, it is important to test sires before their semen is used for *in vitro* embryo production. The faster AR induced by 1mM caffeine was more effective in terms of monospermy and total efficiency of fertilization.

Keywords:

pig; cryopreserved sperm; assessment; capacitation

[fulltext]

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