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JOURNAL ARTICLE

Objectively measured boar sperm motility parameters correlate with the outcomes of on-farm inseminations: results of two fertility trials

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Two fertility trials were undertaken to evaluate the relationship between boar semen quality and fertility (conception rate and litter size) after on-farm artificial insemination (AI). Trial 1 included 98 ejaculates from 27 boars, and trial 2 included 72 ejaculates from 26 boars. The semen quality was measured by computer-assisted semen analysis (CASA) using the Hobson Sperm Tracker. Boar semen was diluted in a standard extender (Beltsville Thawing Solution, BTS), dispensed into 75 ml aliquots each containing 1.5×10^9 spermatozoa and dispatched to farms by overnight mail for use by their normal AI procedures. Randomly selected 75 ml aliquots of semen from each boar were also sent to the institute of Zoology for CASA measurement. Prior to CASA analysis, the spermatozoa were recovered from the BTS using Percoll gradients, resuspended in trisbuffered saline media containing 40 mM Ca⁺⁺, and incubated at 39 degrees C. Parameters of sperm motion were measured after 0, 2, 4, and 6 hours of incubation. Various multiple regression models based on measured motion parameters could account for up to 24% of the variation in litter size. Using logistic regression, highly significant ($P < 0.0001$) models explaining conception rate in terms of sperm motion were derived for trial 2 only. The change in sperm velocity during the first 2 hours of incubation and the magnitude of the velocity parameters after 2 hours were identified as the most consistent indicators of fertility. Other attributes of sperm quality, i.e., frequency of spontaneous acrosome reactions (AR) and ARs induced by ionophore A23187 or solubilized pig zona pellucida, were also examined. When the "within-trial" median litter size was used as a way of allocating ejaculates to "high" or "low" litter-size groups, higher litter size was associated with lower frequency of both spontaneous and induced AR. These results demonstrate that fertility information can be derived from the CASA analysis of boar semen provided it is combined with a period of incubation in capacitating conditions.

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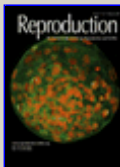
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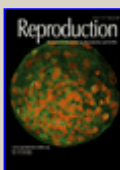


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J. Parrington
In Vivo Gene Transfer by Electroporation Allows Expression of a
Fluorescent Transgene in Hamster Testis and Epididymal Sperm and
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Biol Reprod, January 1, 2006; 74(1): 95 - 101.

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T. Cremades, J. Roca, H. Rodriguez-Martinez, T. Abaigar, J. M. Vazquez,
and E. A. Martinez
Kinematic Changes During the Cryopreservation of Boar
Spermatozoa
J Androl, September 1, 2005; 26(5): 610 - 618.

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▶ HOME

F. Martinez-Pastor, V. Garcia-Macias, M. Alvarez, P. Herraes, L. Anel, and
P. de Paz
Sperm Subpopulations in Iberian Red Deer Epididymal Sperm and
Their Changes Through the Cryopreservation Process
Biol Reprod, February 1, 2005; 72(2): 316 - 327.

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M. Lavitrano, M. L. Bacci, M. Forni, D. Lazzereschi, C. Di Stefano, D.
Fioretti, P. Giancotti, G. Marfe, L. Pucci, L. Renzi, *et al.*
Efficient production by sperm-mediated gene transfer of human
decay accelerating factor (hDAF) transgenic pigs for
xenotransplantation
PNAS, October 29, 2002; 99(22): 14230 - 14235.

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I. M.C. De Pauw, A. Van Soom, H. Laevens, S. Verberckmoes, and A. de Kruif

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L. M. Thurston, K. Siggins, A. J. Mileham, P. F. Watson, and W. V. Holt
Identification of Amplified Restriction Fragment Length Polymorphism Markers Linked to Genes Controlling Boar Sperm Viability Following Cryopreservation

Biol Reprod, March 1, 2002; 66(3): 545 - 554.

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T. Abaigar, W. V. Holt, R. A.P. Harrison, and G. del Barrio
Sperm Subpopulations in Boar (*Sus scrofa*) and Gazelle (*Gazella dama mhorr*) Semen as Revealed by Pattern Analysis of Computer-Assisted Motility Assessments

Biol Reprod, January 1, 1999; 60(1): 32 - 41.

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