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Editors
W. Christopher Scruton
Stephen Claas

Layout
David Brown

Logo Design
Ruth Cronje, and Jan Swanson;
based on the original design by Dr. Robert Dunlop

Cover Design
Sarah Summerbell

The Effect of Storage Volume on the Motility of Stored Extended Semen (17° C)

K. J. Rozeboom, M. E. Wilson, B. C. Day and T. D. Matzenbacher
Minitube of America, Verona, WI.

The objective of this experiment was to determine the effects of storage volume on the motility of fresh boar semen over an extended period of time. In two separate experiments, semen was collected (modified full ejaculate) from 3 sexually mature boars using the gloved hand technique. Following collection, each ejaculate was evaluated for concentration, and percent motile cells was assessed under a phase contrast light microscope. Each ejaculate was then diluted with Androhep PLUS™ semen extender to a final concentration of spermatozoa equal to 3.3 x 10^7/ml and pooled together at 36°C. After pooling, a 2 ml (n=3; glass test tube), 80 ml (n=3, plastic bottle), and 2 l (n=2; bag) aliquot was removed for Experiment 1, and a 2 ml (n=3; glass test tube and n=3; plastic test tube), 80 ml (n= 3; bottle), and 2 l (n=3; bag) aliquot was removed for Experiment 2, and stored at a controlled temperature of 17°C. Stored samples were evaluated under a phase contrast light microscope for % live cells (% motility) by using industry standards for subjective evaluation. All samples were evaluated initially and then days 1, 3, 5 and 7 after collection in experiment 1, and at days 1, 5, 10 and 20 for experiment 2. ANOVA was analyzed using the GLM procedures in SAS (2000, Cary NC). Bonferroni's mean comparisions were used when treatment effects were detected. Differences at $P < .05$ were considered significant. In both experiments, treatment interactions with storage length were detected ($P < .05$). For Experiment 1, % motility declined over the 7 d trial for all treatments ($P < .05$). Furthermore, the 7 d mean average % motility in semen samples stored in 80 ml was greater than semen stored in either 2 ml glass test tubes or 2 l bags (Table 1, $P < .05$). In Experiment 2, the 10 d mean % motility was greater for 80 ml compared to either 2 ml (glass or plastic) or 2 l storage volumes semen (69.3 ± 3.1vs 50.3 ± 3.1, 48.6 ± 3.1, and 46.4 ± 3.1 %, respectively; $P < .05$). All treatment volumes were similar at storage days 1 and 5, however, the mean % motility of semen stored in 80 ml samples did not decline through d 10 when compared to 2 ml (glass or plastic), or 2 l bags (Table 2; $P < .05$). We concluded that there appears to be no advantage to storing extended boar semen in 2 l volumes compared to 80 ml volumes. Under these conditions and storage volumes, motility was optimized at the 80 ml volume. Furthermore, these data strongly suggest that motility may be compromised when semen is stored > 5 d at 2 ml or 2 l volume compared to the 80 ml volume.

Table 1. The gross motility of pooled extended semen stored for 7 days in Androhep PLUS semen extender in 2 ml glass tubes (g), 80 ml bottles, or 2 liter bag volume.[1,2]

	Storage Length (d)			
Volume	1	3	5	7
2 ml g	89 ± 3	55 ± 3^x	60 ± 3	46 ± 3^x
80 ml	85 ± 3	85 ± 3^y	76 ± 3	69 ± 3^y
2 l	80 ± 6	76 ± 6^y	66 ± 6	57 ± 6^y

[1]Mean % gross motility ± SEM.
[2]Different superscripts x,y are different, $P < .05$.

Table 1. The gross motility of pooled extended semen stored for 20 days in Androhep PLUS semen extender in 2 ml plastic tubes (p), 2 ml glass tubes (g), 80 ml bottles, or 2 liters bag volumes.[1,2]

	Storage Length (d)			
Volume	1	5	10	20
2ml p	79 ± 6	85 ± 6	30 ± 6^x	4 ± 3^x
2ml g	81 ± 6	83 ± 6	27 ± 6^x	10 ± 6^x
80 ml	83 ± 6	84 ± 6	83 ± 6^y	27 ± 6^y
2 l	77 ± 6	88 ± 6	20 ± 6^x	2 ± 2^x

[1]Mean % gross motility ± SEM.
[2]Different superscripts x,y are different, $P < .05$.