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Relationship of semen quality, number of sperm inseminated, and fertility in rabbits

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The relationship between the total number of sperm inseminated, semen quality, and fertility in rabbits was investigated, using fractionated or unfractionated semen and different diluting fluids. Semen was from Dutch-belted males collected twice weekly with an artificial vagina. All does were superovulated except in Experiment 3. In Experiment 1, sperm were fractionated on discontinuous 4% and 10% bovine serum albumin columns. Sperm from each portion of the gradient, along with unfractionated controls, were diluted to give 0.25 x 10(6), 0.5 x 10(6), 1.0 x 10(6), and 2.0 x 10(6) total sperm per insemination. In Experiment 2, sperm were diluted with Dulbecco's phosphate-buffered saline to provide 0.10 x 10(6), 0.50 x 10(6), and 1.0 x 10(6) total sperm per insemination, with minimal processing time. In Experiment 3, does were allowed to kindle after inseminating 0.1 x 10(6) or 1.0 x 10(6) sperm. In Experiment 4, sperm were diluted with TALP buffer: seminal plasma 1:1 to 0.025 x 10(6), 0.05 x 10(6), and 0.10 x 10(6) total sperm per insemination. Over 2,800 embryos or unfertilized oocytes were obtained either 24 or 48 hours after insemination to measure fertility. Sperm numbers required for normal fertility were 0.50 x 10(6) in Experiment 1 and only 0.05 x 10(6) in Experiment 4. This reduction presumably was due primarily to reduced processing time and diluent change. Litter size was normal with 0.1 x 10(6) sperm (Experiment 3). In Experiment 4, computer-assisted sperm analysis (HTM 2030 system; Beverly, Massachusetts) was adapted to successfully screen out some of the "interfering" granules in rabbit semen.(ABSTRACT TRUNCATED AT 250 WORDS)

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