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JOURNAL ARTICLE

Choice of operating conditions to minimize sperm subpopulation sampling bias in the assessment of boar semen by computer-assisted semen analysis

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The performance of a computer-assisted semen analysis system was evaluated for use with washed boar spermatozoa. Accuracy was tested using a computer graphics-generated series of spots moving along horizontal, vertical, and diagonal paths, with both straight and sinusoidal trajectories. Observed and expected values agreed to better than $\pm 5\%$, and there was exact agreement in many cases. Reproducibility was tested by making 10 measurements of a single prerecorded sequence of boar spermatozoa. Coefficients of variation were $< 3\%$ for all sperm motion parameters tested. Setup conditions affecting the sample statistics of sperm populations were examined. Search radius (10 settings) and minimum track point (10 settings) were varied factorially to evaluate their biasing effects upon population sampling and accuracy. Low search radius (< 12 microns) or high minimum track point values (> 26 frames) precluded measurements of rapidly moving cells and thus led to selection of slow-moving cells. High search radius (> 16 microns) and low minimum track point settings (< 22 frames) led to erroneous tracking and poor data quality. Suitable settings for these setup parameters (search radius = 13 microns; minimum track points = 24) were chosen for use in subsequent fertility trials because they caused the least sampling bias.

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