

Evaluation of physical and ultra-structural attributes of bulls' semen with variable freezing potential

ABSTRACT

This experiment was conducted to determine the physical and ultra-structural attributes of fresh bull semen and assess their potential use for freezing and AI. A total of 40 semen samples collected from 4 mature bulls (10 samples per bull) were analyzed. The semen samples were examined for colour, volume, concentration, pH, general and progressive motilities, morphologically normal spermatozoa, acrosome and DNA damage, and lipid peroxidation. Transmission Electron Microscopy (TEM) was also performed to evaluate the ultra-structures of the spermatozoa. Results showed the semen colour varied from bull to bull from creamy-white in bull #1, to milky in bulls #2 and 4, then cloudy in bull #3. Highest sperm concentration, lipid peroxidation and pH were recorded from bull #4. Highest volume, progressive motility, morphology, less acrosome damage and viability were from bull #2. While best values for general motility and DNA damage were obtained from bull #1. TEM revealed 92.5, 90.0 and 82% of intact heads for bulls #1, 2 and 3, respectively, much higher than 62.5% for bull #4 and 32.5, 25.0, 37.5% of total defective spermatozoa for bulls #1, 2 and 3, respectively, much better than 80.0% in bull #4. Conclusively, bulls #1, 2 and 3 were consistently satisfactory in most parameters evaluated and hence their semen can be used for freezing. On the other hand, bull #4 expressed higher ($p < 0.05$) sperm concentration but yet was unsatisfactory in most other parameters assessed, including low live:dead ratio and high percentage of abnormalities recorded, manifesting poor potential of freezability.

Keyword: Bull; Spermatozoa; Fresh quality; Ultra-structure; Transmission Electron Microscopy