Investigation of Semen Production and Quality Characteristics of Breeding Bulls

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Semen produced by the breeding bulls in the Central Artificial Insemination Station (CAIS), Kundasale, Sri Lanka is widely used for Artificial Insemination (AI) throughout the country. Thus, it is crucial to analyze the quality of semen of those bulls as it affects the number of straws produced from one ejaculate and conception rates at the field level. The objective of this study was to evaluate and compare AI sires, sire breeds, seasons, calendar years, and months of semen collection with respect to semen quality characteristics. Records on a total of 8436 semen samples of 23 AI bulls collected between 2018 and 2021 were obtained from CAIS. Volume of semen (mL), sperm concentration (millions/mL), initial motility (%) and post-thawing motility (%) were analyzed using Analysis of variance procedure with Duncan's Multiple Range Test for mean comparison. The overall means of semen volume, sperm concentration, initial motility, and post-thawing motility were 5.11 mL, 734.24 millions/mL, 75.73%, and 56.70%, respectively. Semen volume was significantly (P<0.05) affected by AI sire, sire breed, season, year, and month of semen collection. Significant (P<0.05) differences were observed among AI sires, years, seasons, and months for sperm concentration. Sperm concentration had a significantly (P<0.05) negative correlation with semen volume (r =0.1). Maha (October-March) season recorded significantly (P<0.05) a higher mean semen volume (5.36 mL) and a lower mean concentration (710.1 millions/mL) than Yala (April-September) season (4.88 mL, and 756.1 millions/mL, respectively). Initial motility was significantly influenced by all of the factors considered above. The difference among seasons was not significant (P<0.05) for post-thawing motility. Post-thawing motility had a significantly (P<0.05) positive correlation with initial motility (r=0.36). This study revealed that although the semen quality- parameters of all sires considered were above the minimum standards required, potential exists to improve sire performance further by providing better management conditions.

Keywords: Artificial insemination, Initial motility, Semen volume, Sperm concentration, Post-thawing motility

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