Understanding the Sperm motility behavior in Crossbred Bulls using Computer Assisted Semen Analysis (CASA)

S Rai[1], R.Behara[2], M.Karunakaran[3], A.Mandal[4], M.Mondal[5], S. Tyagi[6] and C.Bhakat[7]

[2,3,4,5,7]*National Dairy Research Institute, ERS-Kalyani, W.B, 741235, India*
[1,6]*Central Institute for research on Cattle, Meerut Cantt, Uttar Pradesh 250001, India*
E-mail: [1]drsaroj.rai@gmail.com

Abstract—*The study was conducted to evaluate the sperm kinematics of Frieswal bull after dilution in egg yolk-glycerol-Tris (EYGT) buffer using Computer Assisted Semen Analyzer before subjecting to equilibration at 4°C. Individual sperm cells were tracked by CASA as rapid, medium and slow motile. The overall quality of the neat semen in respect to volume (ml), concentration (M/ml), initial motility (%), post thaw motility(%), live(%), abnormality(%) and HOS reactive sperm(%) was 4.78±0.24, 1439.38±75.36, 72.40±0.61, 39.40±2.39, 73.18±1.90, 7.07±0.60 and 45.12±2.44 respectively. While, CASA has generated motility (MOT, %), progressive motility (PMOT%), Average Path Velocity (VAP, μm/s), Straight Line Velocity (VSL, μm/s), Curvilinear Path (VCL, μm/s), lateral head displacement (ALH, μm), Beat Cross Frequency (BCF, Hz), Straight Line Path (STR,%) and Linearity (LIN,%) as 74.00±1.44, 47.88±2.05, 115.88±2.44, 78.25±2.33, 209.40±4.26, 7.95±0.10, 29.01±0.37, 71.06±1.43 and 41.04±0.79 respectively. The kinematic parameters of rapid, medium and slow motile sperms were highly variable (p<0.001). However, these sperm motility varied only in respect to ALH and BCF (p<0.05) between bulls. Rapid motile spermatozoa represented the one with high velocity. The spermatozoa in medium motile subpopulations had poor velocity (VAP, VCL, ALH and BCF) in spite of its ability to move in a straight line path (SRT>70). The slow moving cells had good head and flagella movement (ALH and BCF) but their motility was more or less circular like that of a hyperactive cell (VSL=10.91, LIN=9 and STR=22.54). It maybe concluded that the rapidly moving sperm cells maybe most suitable for fertilizing population and further verified by in vivo test.*