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# Scrotal Infrared Digital Thermography Predicts Effects of Thermal Stress on Buffalo (*Bubalus bubalis*) Semen

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## Abstract

The objective was to use scrotal infrared digital thermography to evaluate effects of thermal stress on semen quality of Murrah buffalo (*Bubalus bubalis*) breeding bulls. Ejaculates from 109 Murrah bulls maintained at three semen stations were evaluated for: ejaculate volume, sperm concentration (SCON), initial motility (IM), percent live sperm (LIVE), acrosome integrity of fresh semen (AIFS), plasma membrane integrity of fresh semen (PMIFS), head abnormalities of fresh semen (HAFS), midpiece abnormalities of fresh semen (MPAFS), tail abnormalities of fresh semen (TAFS), post-thaw motility (PTM), acrosome integrity of post-thawed semen (AIPT) and plasma membrane integrity of post-thawed semen (PMIPT). Scrotal and ocular surface temperatures were acquired during rainy, winter and summer seasons, using an FLIR i5 infrared camera. Thermographic images were analyzed with Quick Report 1.2 SP2 software and temperature data acquired. Daily mean temperature and mean relative humidity were used to determine the temperature-humidity index (THI). Environmental factors were analyzed using CORR to determine collinearity among independent variables. There was a high correlation among THI, proximal, mid and distal scrotal temperatures ($r \geq 0.73$). Therefore, distal pole temperature (DPT), THI,