

Equine Cooled-Semen Shipping Container Effectiveness Comparison

Stephanie Guice,^a Philip H. Kass,^b Bruce W. Christensen^b

^aDepartment of Animal Biology, ^bDepartment of Population Health and Reproduction, School of Veterinary Medicine, University of California, Davis, CA

The objective of this project was to determine the effectiveness of cooled-semen shipping containers by comparing total and progressive motility after 24 h of cooled storage in the containers at ambient temperature. The three container types included Equitainer™ (ET; Hamilton Research, Inc., Ipswich, MA), Equine Express II™ (EE; Exodus Breeders Corporation, York, PA), and EquiSaver (ES; Platilite Corporation, Omaha, NE). Two ejaculates were collected on separate days from two Thoroughbred stallions (15 and 19 y.o.) with recently documented fertility. Each ejaculate was evaluated for concentration, total motility, and progressive motility using a computer assisted semen analysis system (SpermVision SAR®, MOFA Global, Verona, WI). The semen was diluted with Revolution™ extender with gentamycin (Reproduction Resources, Inc., Walworth, WI) to a concentration between 25-50 x 10⁶/mL. Each extended ejaculate was divided into nine, 5 mL aliquots in polystyrene tubes wrapped with parafilm. The tubes were placed in 50 mL centrifuge tubes, surrounded by 22°C water. One aliquot of each stallion's semen was placed in each of the nine shipping containers, three containers from each of the three companies, along with a temperature data logger (Digit-TL LabJack®, Lakewood, CO), which recorded temperature readings every 10 minutes. After 24 h storage between 21 and 23°C, each aliquot was evaluated for total and progressive motility. Mixed effects linear regression was used to model the effects of time and shipping container company on total and progressive motility measures, and temperatures inside of the containers (Stata IC/13.1, StataCorp LP, College Station, TX).

The 24 h total motility and progressive motility were similar in all aliquots, regardless of container (P=0.86 and P=0.94). The temperatures of the containers at 24 h ranged from 1.9°C to 16.1°C depending on the company (average temperatures: ET 15.8°C, EE 7.6°C, and ES 2.4°C). There were significant differences in temperatures detected between all three companies at 24 h (P<0.05). Overall while there were significant differences detected in the internal temperatures between the shipping containers, there were no significant differences in the effectiveness of these containers keeping semen motile for 24 h while the containers were stored at room temperature. The next step would be to test the containers in more extreme conditions. Further studies should determine how wide the range of temperatures could be inside the containers before motility is significantly affected.

Keywords: stallion, cooled semen, shipping containers, sperm motility