

THE INFLUENCE OF MANAGEMENT AND VETERINARY PRACTICES ON REPRODUCTIVE PERFORMANCE IN THE THOROUGHBRED MARE

K. Bosh, M.H. Gluck

Equine Research Center, University of Kentucky, Lexington, KY, USA

The objective of this study was to examine the effects of management and veterinary practices on reproductive performance of Thoroughbred mares in central Kentucky. Using a prospective cohort design, breeding records were collected from 13 farms in central Kentucky during the 2004 breeding season, and 12 farms in 2005. Factors influencing pregnancy outcomes on day 15 and pregnancy loss between days 15 and 40 were analyzed using multiple logistic regression for clustered data with SAS (Version 9.1, SAS Institute Inc., Cary, NC, USA).

In 2004, data was available from 1091 mares bred on 1718 cycles, with 38.1% of the mares being bred more than one time during the season. In 2005, 894 mares were bred on 1390 cycles, with 37.8% of the mares being bred more than one time. The characteristics of age, status, and average number of cycles bred were similar between the years.

The days 15 and 40 pregnancy rates and pregnancy loss from days 15 to 40 both per cycle and per season were similar between the 2 years. The average pregnancy rates per cycle on days 15 and 40 were 62.0% and 55.8%, respectively. Pregnancy loss from days 15 to 40 per cycle was 9.9%. The average pregnancy rates per season on days 15 and 40 were 92.0% and 89.3%, respectively. Pregnancy loss from days 15 to 40 per season was 3.0%.

Although the overall per cycle pregnancy and pregnancy loss rates were similar between the 2 years, there were significant differences in per cycle pregnancy and pregnancy loss rates between the years on individual farms. On one farm the day 15 per cycle pregnancy rate was 14.7% greater in 2005 than 2004.

In the 2005 foaling season, the live foal rates per cycle and per season were 50.8% and 78.4%, respectively. Pregnancy loss from day 40 to foaling was 12.3%.

The following significantly increased the odds of the mare being pregnant on day 15: mares bred to a stallion with a large (>110 mares) book size, and mares given progesterone supplementation between breeding and the day 15 pregnancy check. As mare age increased, the odds of being pregnant on day 15 decreased significantly. Several farm characteristics were tested, but were not significant in the multivariable model (e.g., boarding mares for clients, regular ultrasound use pre-breeding,

record keeping system, farm size, and presence of a culling program). However, there were significant differences in the day 15 pregnancy outcomes between farms even after controlling for factors listed above. This emphasizes more work is needed to determine farm level characteristics influencing pregnancy rates on day 15.

The following significantly increased the odds of losing a pregnancy between days 15 and 40: increasing mare age, and being a foaling mare at the start of the season. There were not significant differences in pregnancy loss between the farms. Due to the variability of pregnancy and pregnancy loss rates within farms by year it is important to collect data over a multi-year period when studying factors that influence pregnancy rates and pregnancy loss.

Keywords: Mare; Pregnancy; Reproductive performance

UTILITY OF THE SPERM CHROMATIN STRUCTURE ASSAY (SCSA) FOR INCREASED REPRODUCTIVE EFFICIENCY IN LARGE ANIMALS

Donald P. Evenson^{1,2}, Regina Wixon²

¹*Department of Biology and Microbiology, South Dakota State University, SD, USA;* ²*SCSA Diagnostics, Brookings, SD 57006, USA*

The DNA fragmentation index (DFI), as derived by the Sperm Chromatin Structure Assay (SCSA), is a measure of sperm DNA fragmentation in humans and animals. While a semen evaluation provides information regarding the external physical characteristics of sperm, it does not address sperm DNA fragmentation, which has been shown repeatedly by various assays to have a significant negative effect on pregnancy outcome in animals and humans.

Frozen/thawed semen was treated for 30 s with pH 1.20/detergent buffer, stained with acridine orange and measured by flow cytometry as previously detailed.

Fertility is assessed in stallions by a breeding soundness exam, usually including a physical exam and a routine semen analysis. Significantly lower DFI and a higher seasonal pregnancy rate (SPR) were found in fertile stallions in comparison to the sub fertile group. Correlations between DFI and motility/morphology showed significant but biologically weak relationships which are in agreement with human data. Medications have been shown to negatively affect sperm DNA fragmentation in humans. Likewise stallions and bulls exposed to hormonal or therapeutic