

## **Subfertility in a stallion caused by a genetic mutation affecting the acrosome reaction**

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Stallion subfertility is a major source of reproductive and economic loss in the horse industry.<sup>1</sup> Diagnosis is often through conventional methods, e.g. evaluation of sperm motility and morphology, but occasionally routine testing is inadequate when stallions exhibit normal sperm quality and no apparent cause for subfertility.<sup>2</sup> Semen samples (fixed and frozen) of a 5 year old Thoroughbred stallion were received by mail and evaluated for morphology and DNA quality. Approximately 6 days later, a cool-shipped semen sample was assessed for sperm motility, morphology, and viability. Breeding record evaluation (until May 7, 2018) indicated that the stallion impregnated 17/37 (46%) mares in 3.11 cycles/pregnancy (32% pregnancy rate per cycle). Pregnancy rate was higher in March (6/14; 43%) when fewer mares were bred than April (8/25; 32%). Results of initial sperm evaluation (normal: 69% and abnormal DNA: 12%) and cool shipped sample (total motility: 76%, normal sperm: 54%, and viability: 72%) indicated good to excellent sperm quality, inconsistent with level of subfertility. Initial diagnosis was overbreeding, supported by higher fertility of mares bred early in breeding season, compared to mares bred later in breeding season, when more mares were being bred. Following breeding season, a hair sample from the stallion was analyzed and found to be positive for impaired acrosome reaction (IAR) susceptibility gene (FKBP6). Test for IAR was not considered initially because the level of fertility in this individual, while subfertile, was higher than a previous report (< 20% per cycle).<sup>2</sup> This gene (FKBP6) has implications as a potential location for single nucleotide polymorphisms associated with IAR which can lead to stallion subfertility not explained by poor sperm quality.<sup>1,3,4</sup> Additionally, this stallion was unusual compared to previous stallions with this condition because his fertility was higher.

**Keywords:** Stallion, impaired acrosomal reaction, FKBP6

### **References**

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