

Does Summer's Heat Impact Stallion Fertility?



In the equine industry, it is not uncommon for stallions to endure periods of intense exercise in preparation for an upcoming show or competition. This preparation is vital for the success of each horse, which in turn determines the breeding fees owners can charge when standing a stallion. However, horse owners may worry that heat stress can cause fertility issues.

The summer months bring many enjoyable horse-related activities, but they also bring heat and humidity. For many equine athletes and riders, the warmer temperatures can result in increased heat stress. To avoid the added stress of extreme summer temperatures, many trainers and riders exercise their horses in the early morning or late evening hours when temperatures are slightly more tolerable. However, in some areas, mornings and evenings still hold high humidity, which can fatigue horses fairly quickly. Also, many trainers and owners aren't able to exercise horses when the temperatures are lower.

Many horse owners question how this may affect their horse's reproductive performance. A stallion's

testicles are close to the abdominal wall, and the internal temperature of the scrotum stays a few degrees cooler than the rest of the body. Researchers have evaluated how the scrotum and its structures can relieve elevated temperatures brought about by heat stress (from sickness, environmental stress, or exercise) (Mawyer et al., 2012; Rosenberg et al., 2013). Other researchers investigated how intense exercise might negatively affect sperm production and fertility rates (Janett et al., 2006).

In a recent study, a group of eight stallions became models for the simulation of stressors normally experienced by a horse being trained during above-average temperatures. To monitor internal temperature, each stallion had a thermal sensory device implanted into its scrotum. These scrotal implants provided information regarding the elevated internal scrotal temperatures experienced by stallions during strenuous exercise in hot and humid ambient temperatures reaching 96°F and higher (Figure 1). To simulate the weight of a saddle and rider an average performance horse would bear, the stallions were

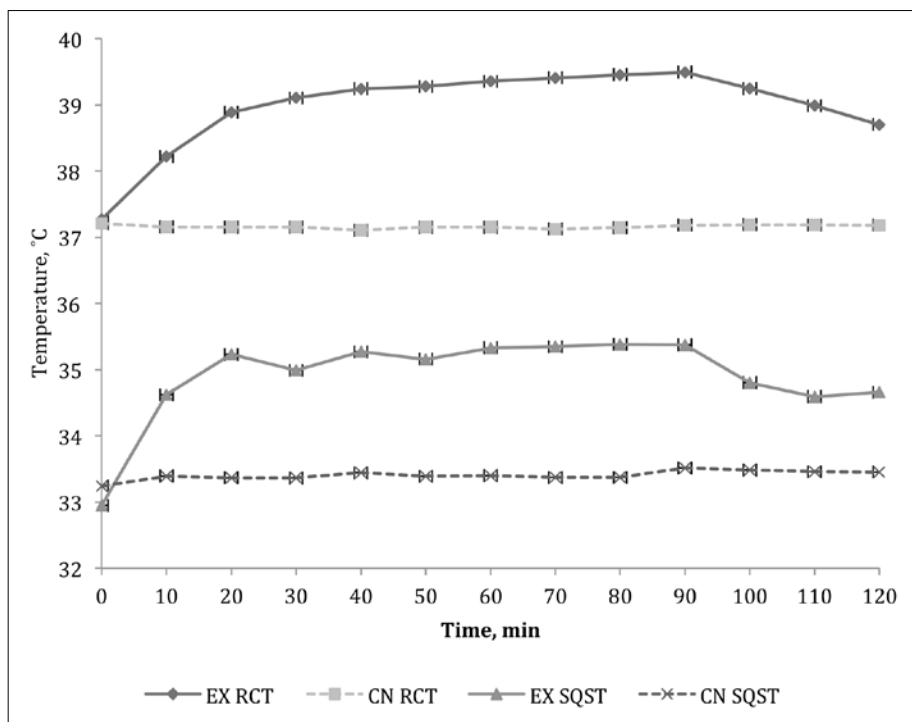


Figure 1. Rectal (RCT) and subcutaneous scrotal (SQST) temperature during exercise for treatment (EX) and control (CN).

fitted with pack-weight saddles and exercised in a round pen for 90 minutes. To ensure consistency in workout intensity, a heart monitor was used to maintain the exercising stallions' heart rates between 145 and 155 beats per minute (Rosenberg et al., 2013).

In the second part of this study, semen from the stallions was collected and analyzed several days after intense exercise. Mean characteristics for semen samples between non-exercised and exercised stallions were recorded and compared. Seminal volume, concentration, total sperm per ejaculate, morphologically normal sperm, total sperm motility, progressively motile sperm, and sperm with abnormal DNA were quantified and used to determine sperm quality. Interestingly, though scrotal temperatures significantly increased during the strenuous exercise program (from 92°F in control stallions to 96°F in stallions at peak exercise), stallion spermatozoa quality output did not differ for the two groups. Though previous reports have shown reduced sperm quality in stallions in training, results from this study suggest that causes other than elevated scrotal and body temperature may have caused these fluctuations.

This study shows stallions are able to overcome scrotal hyperthermia from exercise stress. Stallions may be strenuously exercised in extremely hot and humid environments without inducing testicular temperatures that are reproductively damaging. This provides reassurance to stallion trainers and riders whose stallions are serving dual duty in shows and breeding barns.

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