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Thermoregulation in the horse in response to exercise

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Summary

Conversion of stored energy into mechanical energy during exercise is relatively inefficient with approximately 80% of the energy being given off as heat. Relative to many species the horse suffers an apparent disadvantage by possessing a high metabolic capacity yet a small surface area for dissipation of heat, particularly as evaporation of sweat is the major method of heat dissipation. Under most conditions of exercise at least two-thirds of the metabolic heat load is dissipated via this means with sweat losses of more than 10 l h^{-1} reported. The remaining exercise induced heat load must be stored (reflected by an increase in core temperature), dissipated across the respiratory tract or lost via other mechanisms. Respiratory heat loss can account for dissipation of more than 25% of the metabolic heat load during exercise. Under conditions where ambient temperature and humidity are high, evaporative heat loss will be limited thereby posing an increased risk of thermal stress if exercise is continued. Additionally, concurrent dehydration reduces conductance of heat from core to periphery, further increasing the risk of heat induced illness. A basic understanding of the thermoregulatory

Increasing the risk of heat induced illness. A basic understanding of the thermoregulatory responses in the exercising horse is imperative if heat induced illnesses are to be avoided. If they do occur rapid recognition and effective management are essential.



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Keywords

Thermoregulation; heat dissipation; exercise hyperthermia

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