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Pilot Study in Physiological Monitoring and Metabolic Adaptation during a Progressive Conditioning Program in Horses

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Abstract: This pilot study evaluated physiological and metabolic adaptation in two Arabian geldings during a 12-week Long Slow Distance (LSD) conditioning program. Heart rate and lactate were monitored weekly using Polar Equine H10 and Lactate Pro 2 analyzers. Resting and post-exercise heart rates decreased (44–48→36–38 bpm; 108–115→68–72 bpm), lactate dropped (7.1–7.8→2.9–3.2 mmol/L), and recovery time improved (>20→8 min). These changes show enhanced aerobic fitness, faster recovery, and reduced lactic acidosis. Gradual workload progression and fibre-oil nutrition supported safe, welfare-oriented conditioning under veterinary supervision.

• Introduction

Endurance training in horses requires gradual workload increase and controlled metabolic adaptation. The Long Slow Distance (LSD) method enhances aerobic capacity while preventing musculoskeletal overload.

• Material and method

Two Arabian geldings (8 y, 9 y; 430 ± 15 kg) followed a 12-week LSD program: walking, trotting, cantering, tapering. Physiological parameters, HR_{rest}, HR₁₀, lactate, recovery, were measured weekly using Polar Equine H10 and Lactate Pro 2. Nutrition was based on fibre, beet pulp, vegetable oil, and electrolytes.

• Results and discussions

HR_{rest}: 44 → 36 bpm (–18%)
HR₁₀: 108 → 68 bpm (–37%)
Lactate: 7.1 → 2.9 mmol/L (–59%)

Recovery: >20 → 8 min (–60%)
Both horses showed improved aerobic metabolism and cardiovascular efficiency. No metabolic or orthopedic issues occurred.

• Conclusions

LSD-based conditioning improved fitness and recovery while maintaining welfare. Continuous veterinary monitoring ensures safe adaptation and sustainable endurance performance.



Figure 1: Placement of the Polar Equine H10 heart rate sensor on the horse's thoracic region.

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