



Biochemical, haematological and bodyweight changes in horses competing in the 160km

Sultan's Cup

Terengganu Endurance Challenge

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Introduction

- Endurance continues to be a rapidly growing and highly competitive sport on a global basis
- Average race speeds for championship rides have increased significantly over the last 20 years
- At the same time completion rates have fallen
- Endurance rides are now being held in a greater variety of climates – e.g. desert, semi-tropical
- There is limited information on the effects of heat or heat and humidity combined with speed on the health and welfare of endurance horses



Aim

- To collect simple weight and blood data on horses competing in the 2006 160km Sultan's Cup Terengganu Endurance Challenge in order to investigate the effects of high heat and humidity on endurance horses in competition



Methods and Materials (1)

- All horses taking part in the 160km class (n=23) were recruited to take part in the study
- Pre-ride blood samples collected ~5h before start
 - 3 ml, purple top; 10 ml red top; 3 ml Grey top (Sodium & Potassium Oxalate for Glucose)
- Pre-ride weight was measured on a weighbridge ~4h before the start of the ride
 - Indicator – Ruddway 300 & Load Cell Bars MP 600



Methods and Materials (2)

- Post-ride blood samples were collected only from horses that completed the ride and within 60 minutes of finishing
- Weight was measured at each vet gate



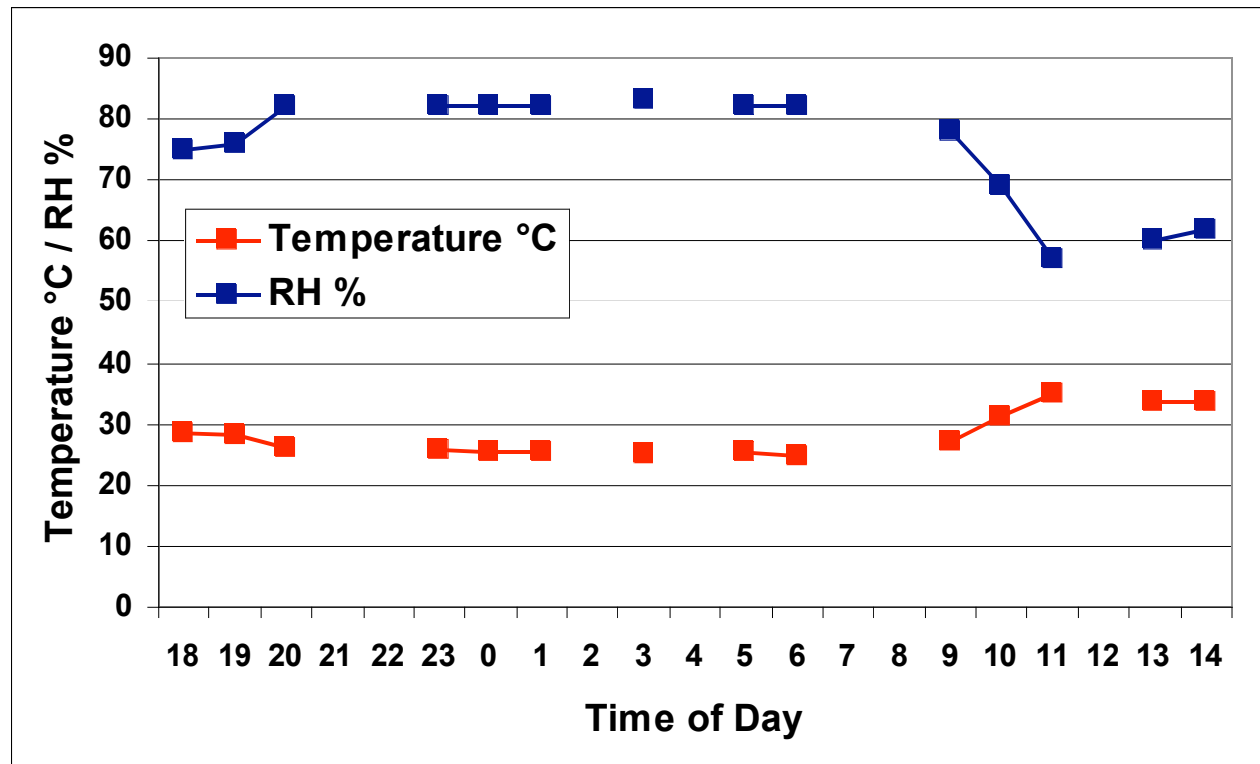
Methods and Materials (3)

- Blood samples were placed in tubes containing EDTA for haematology and plain tubes to harvest serum for biochemistry or grey top Sodium & Potassium Oxalate (for Glucose)
- Analysis was performed within 2 hours of collection on Humacount & Spot Chem analysers



Results

Environmental conditions



Data courtesy of Mr John Robertson, UK



Results

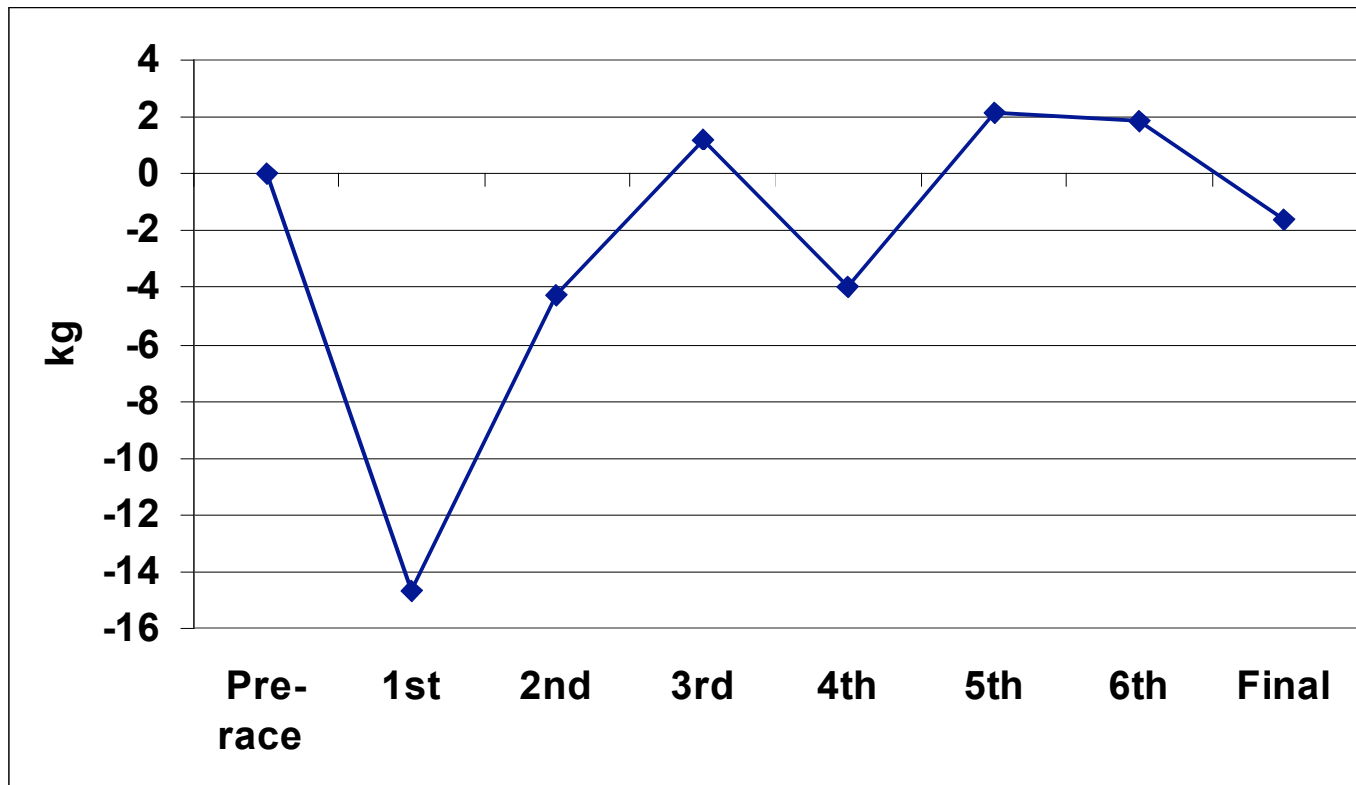
Completions/Eliminations

- 13/23 horses completed
- Average speed of the 1st placed horses was 12.7 km/h
- Average speed of finishers was 11.1km/h
- 10/23 eliminated
 - Lameness = 5
 - Metabolic = 4
 - By rider = 1



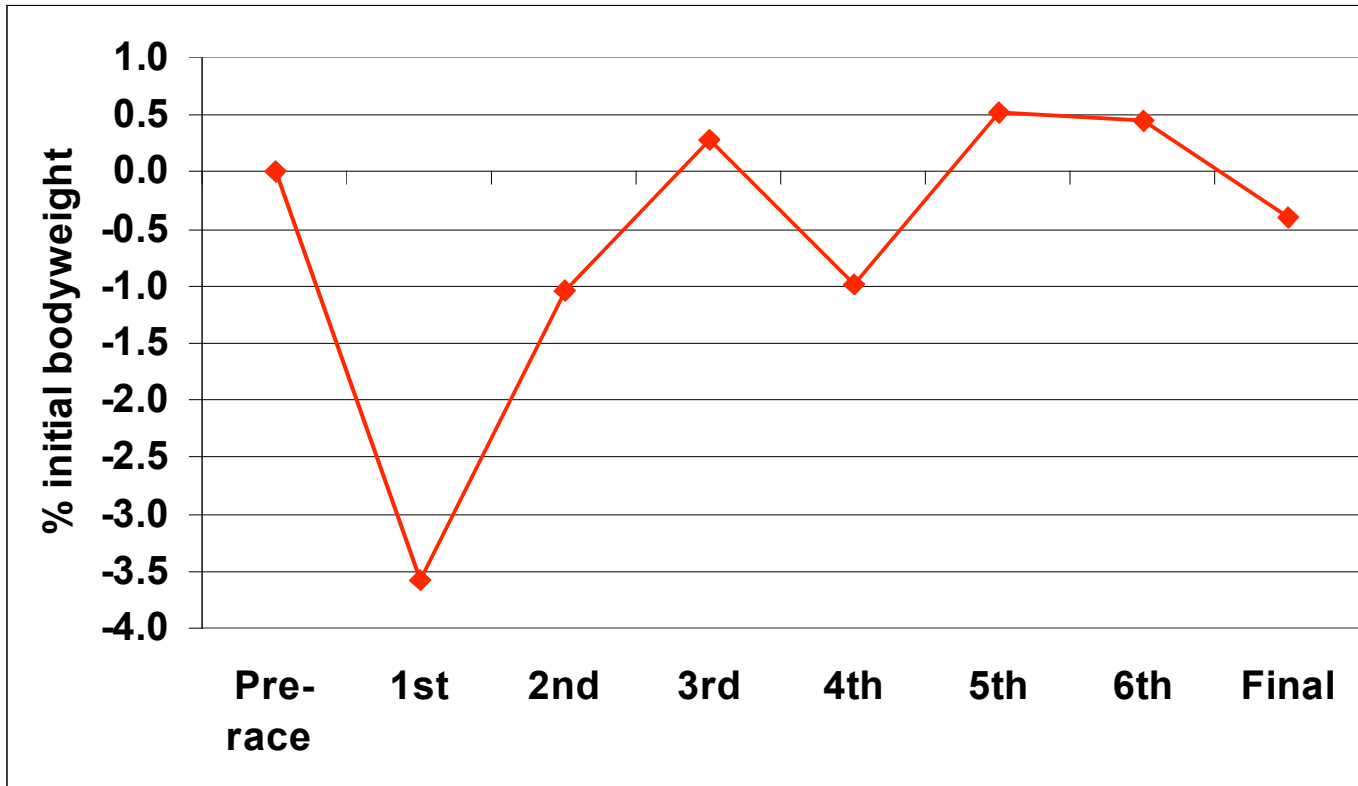
Results

Weight loss (kg) per loop



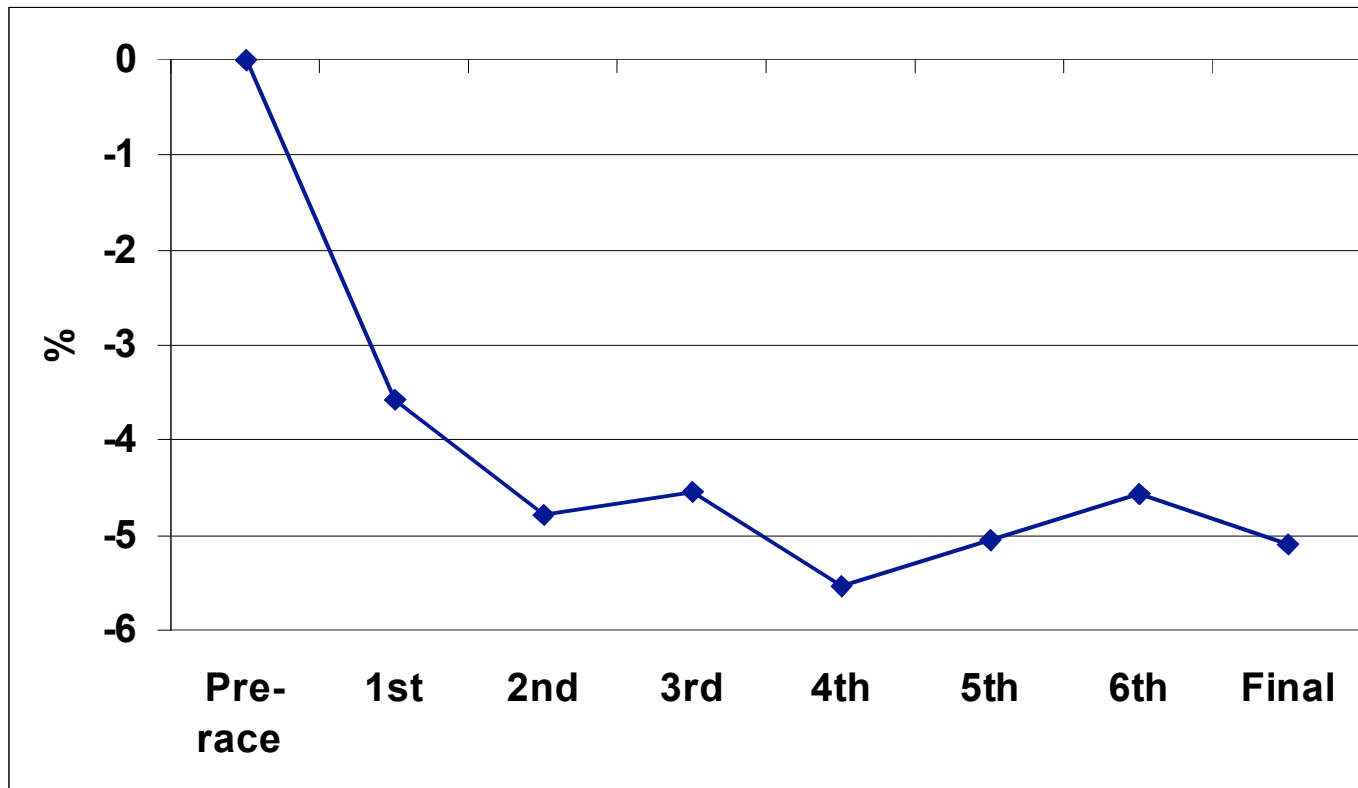
Results

Weight loss (% bodyweight) per loop



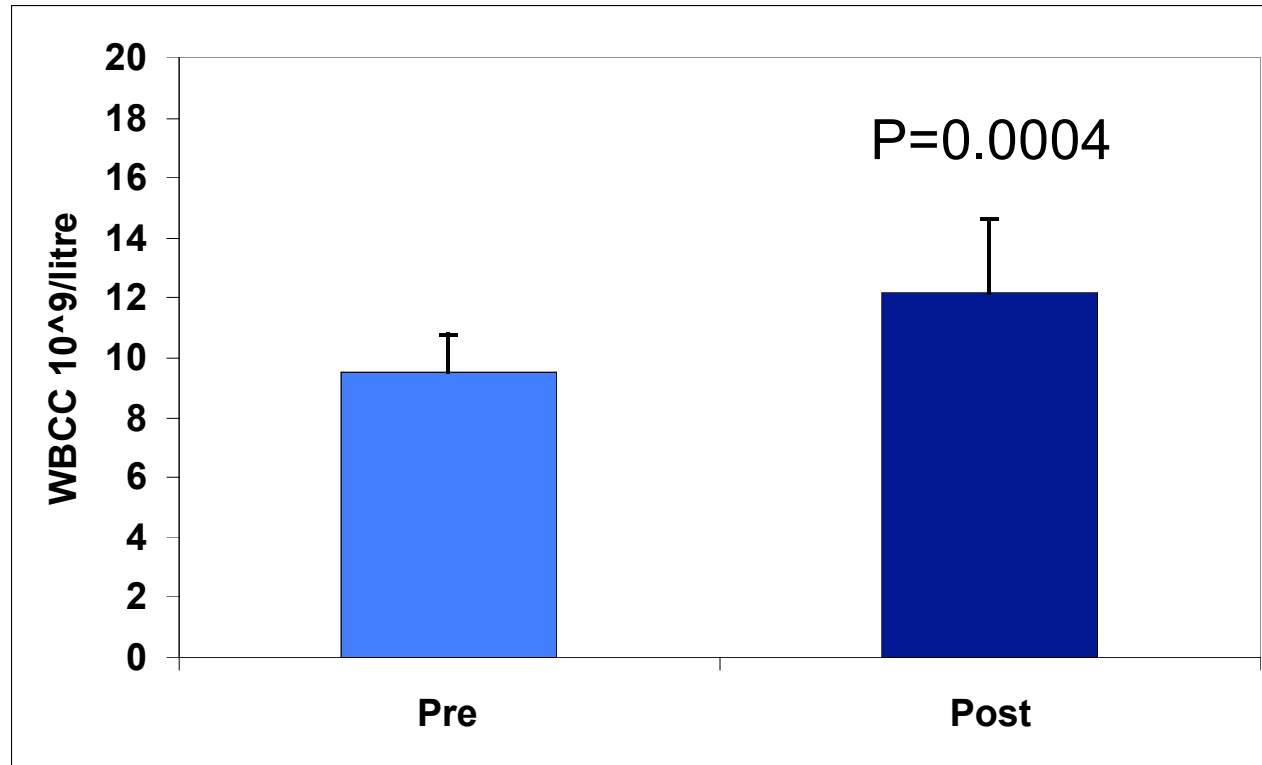
Results

Cumulative weight loss (% bodyweight)



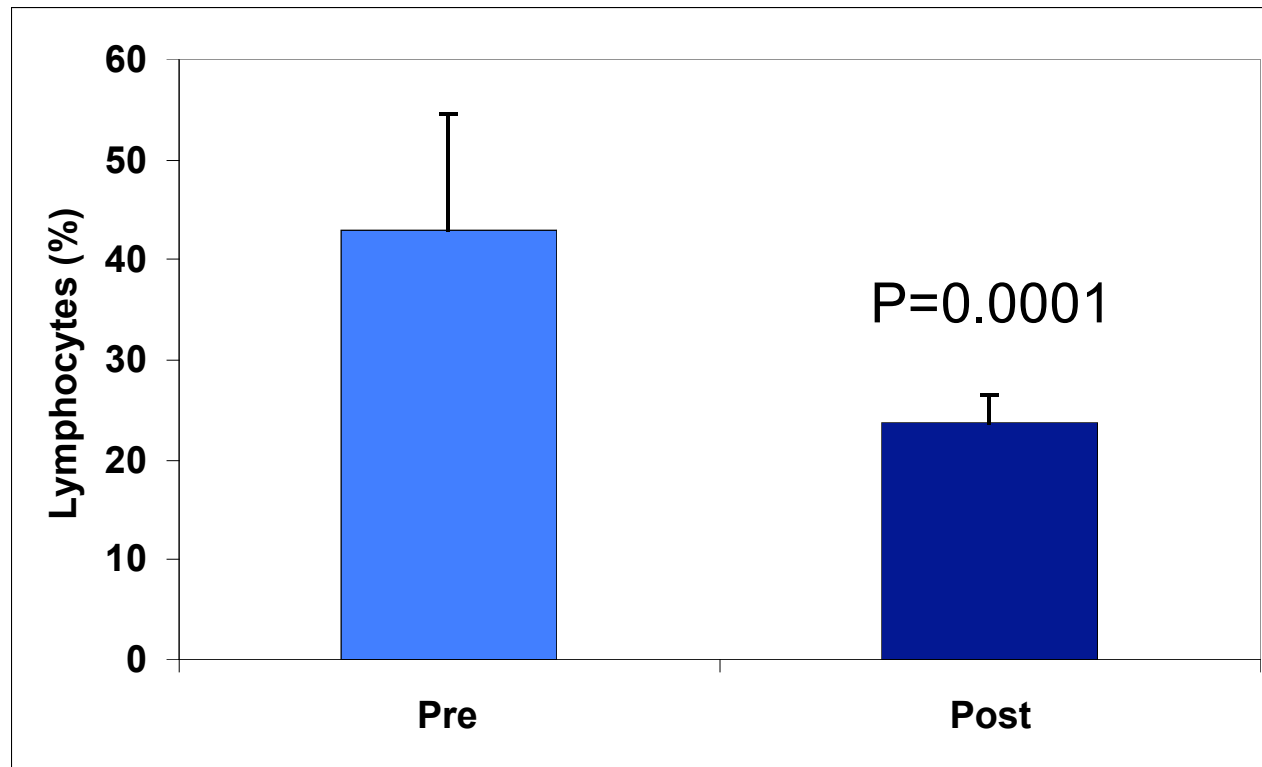
Results

Haematology - WBC



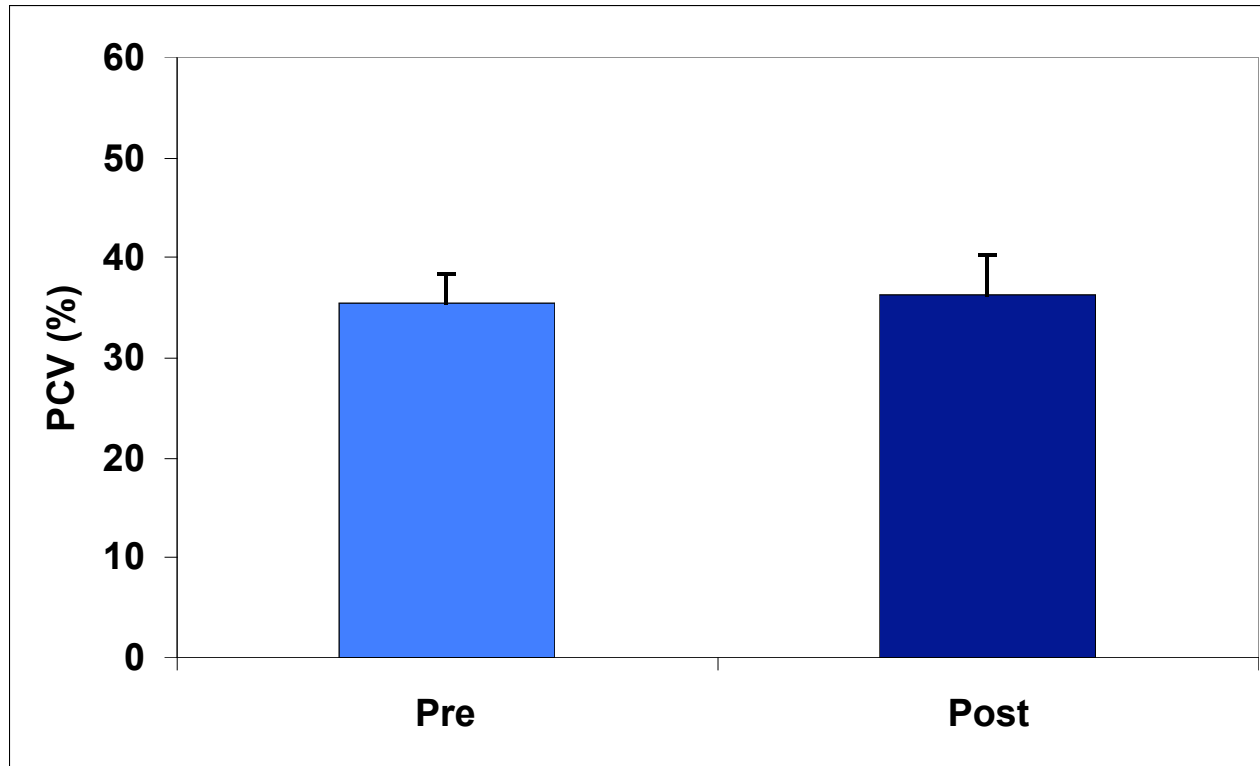
Results

Haematology - Lymphocytes



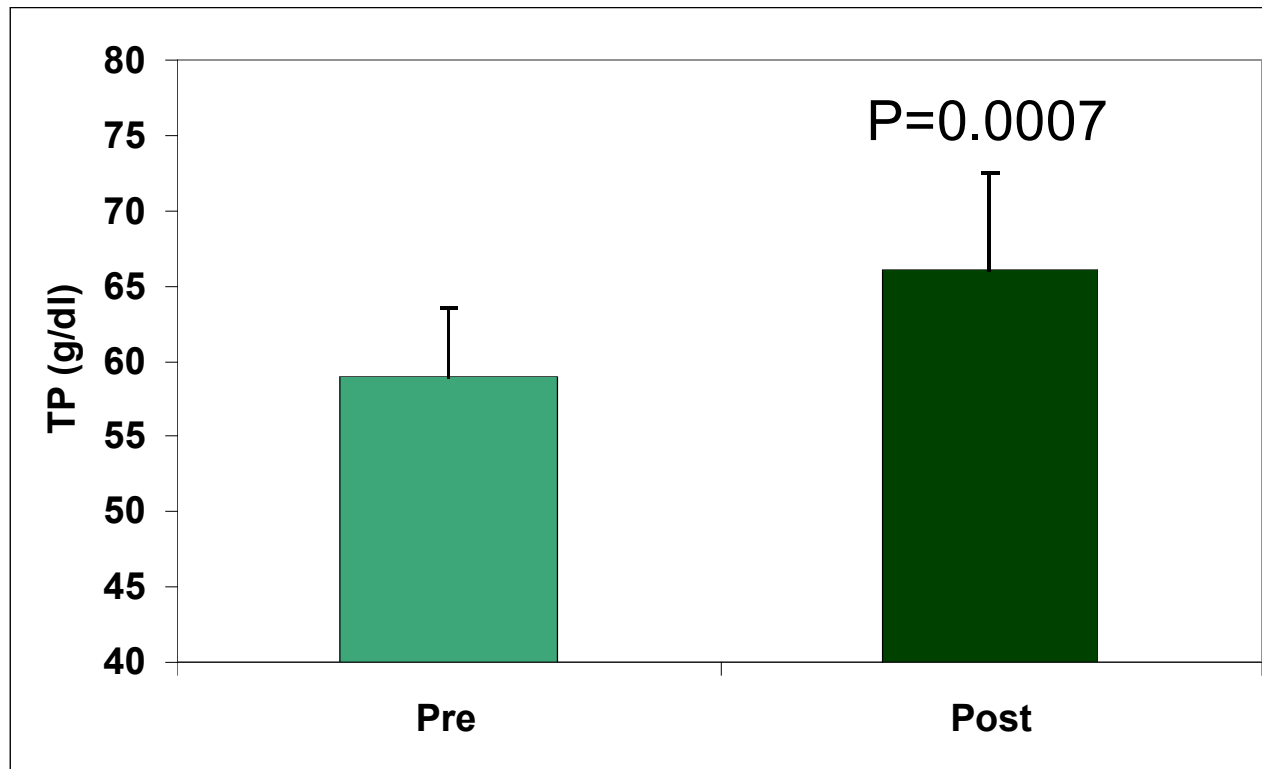
Results

Haematology - PCV



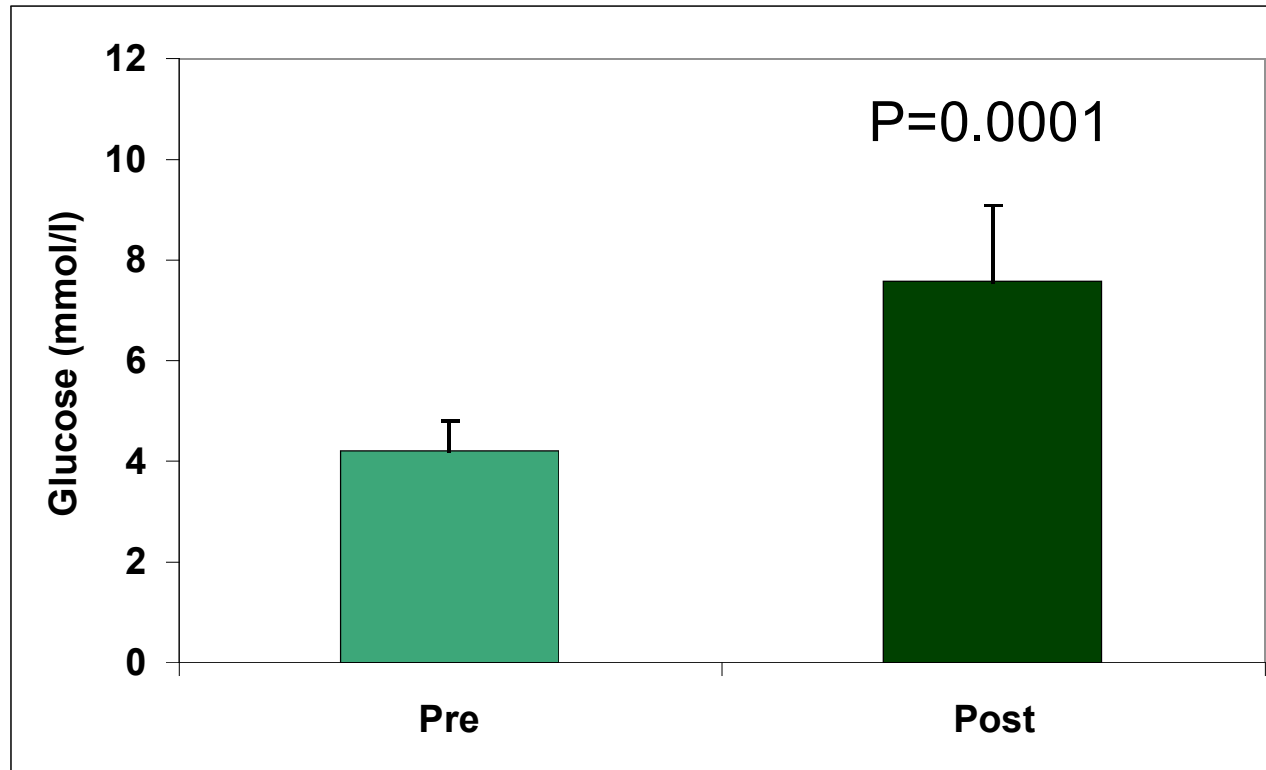
Results

Biochemistry – Total Protein



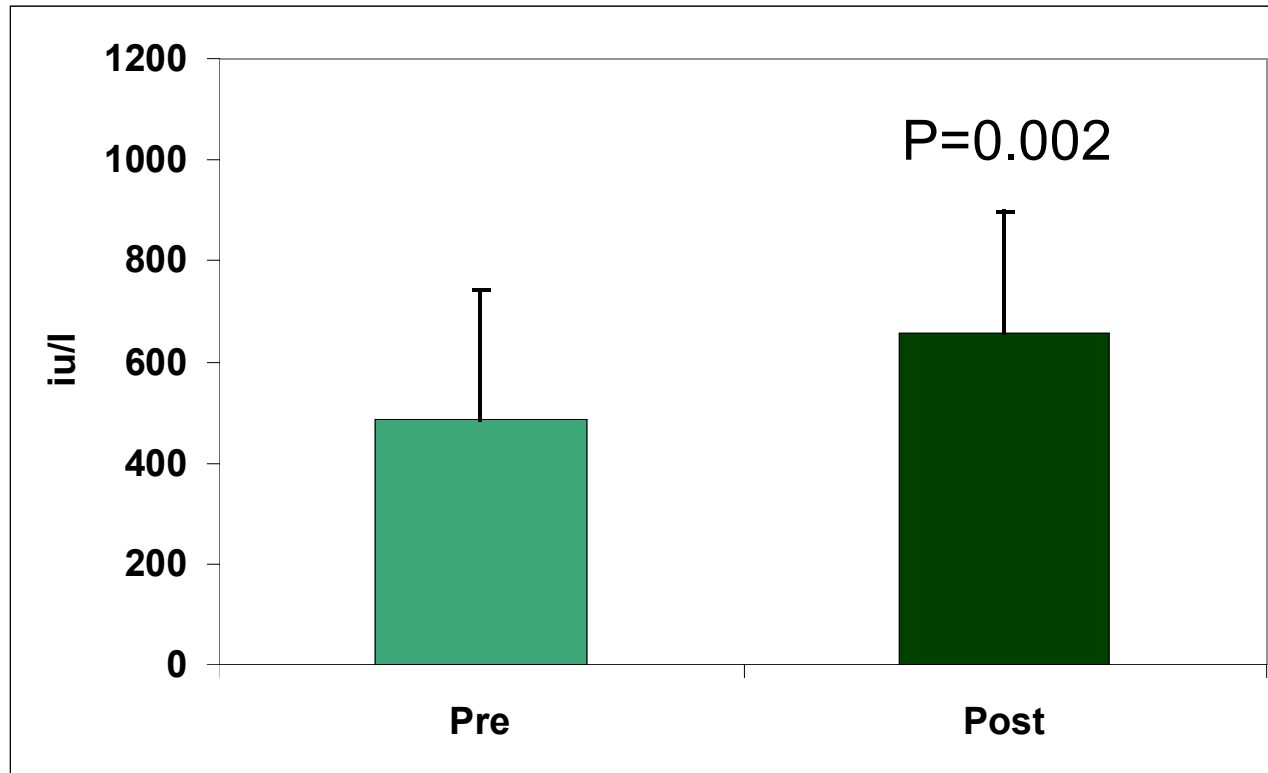
Results

Biochemistry – Glucose



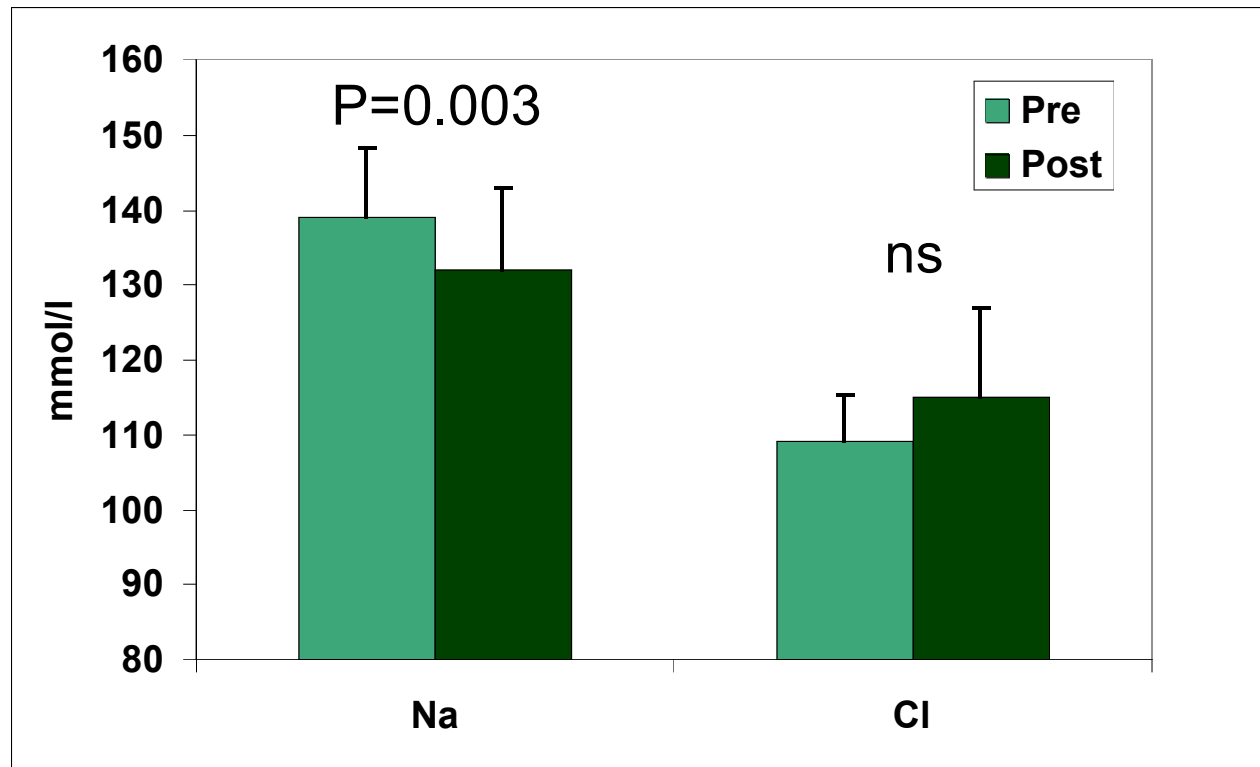
Results

Biochemistry – AST



Results

Biochemistry – Sodium and Chloride



Discussion (1)

Weight loss

- Average bodyweight loss of ~5%
 - Winning speed 12.7 km/h
 - Average speed 11.1 km/h
 - Estimated mean WBGT index 27°C
- Average loss of 6.4% reported by Schott *et al.* (2006) for finishers in an FEI*** 160km ride in UK
 - Winning speed 17.8 km/h
 - Average speed 15.2 km/h
 - Mean WBGT index 18°C



Discussion (2)

Haematology and Biochemistry

- In general, changes less extreme or similar to those previously reported for faster rides in cooler climates



Conclusions

- A 160km ride in a climate with a high WBGT index and with a slower ride speed produced changes in bodyweight and blood haematology/biochemistry less extreme or similar to those for faster rides in cooler climates

