Probiotic Supplementation and Gastrointestinal Endotoxemia Before and After the Marathon Des Sables.

Craig A. Suckling1, Justin D. Roberts1, Georgia Y. Peedle1, Dan A. Gordon1, Hannah Marshall2, Lee Taylor2 and Michael G. Roberts3. Anglia Ruskin University, United Kingdom1; University of Bedfordshire, United Kingdom2; University of Hertfordshire, United Kingdom3.

Whilst evidence of increased gastrointestinal endotoxemia (GE) has been previously demonstrated during single-day ultra-endurance events, less is known on the prevalence of GE following extreme ultra-events such as the Marathon Des Sables (MDS). The potential benefit of probiotic formulas on gut integrity during ultra-endurance events also requires further investigation.

PURPOSE: To assess the impact of probiotic supplementation with or without glutamine on GE prevalence in runners competing in a multi-day ultra-run (MDS).

METHODS: Thirty four healthy participants from the 2015 MDS UK cohort volunteered for a 12 week pre-race intervention and were randomly assigned to either: probiotic (PRO; 100mg.d⁻¹ lactobacillus acidophilus) (age 40 ±3 yrs., weight 79.4 ±2.0 kg, VO₂max 4.2 ±0.1 L.min⁻¹), probiotic with glutamine (PROglut; 40.5mg.d⁻¹ lactobacillus acidophilus and 900mg.d⁻¹ L-glutamine) (age 39 ±2 yrs., weight 70.6 ±4.8 kg, VO₂max 4.0 ±0.2 L.min⁻¹) and control (CON) (age 42±3 yrs., weight 79.2 ±3.8 kg, VO₂max 4.0 ±0.3 L.min⁻¹). Plasma lipopolysaccharides (LPS) (via Limulus Amebocyte Lysate chromogenic endotoxin quantification) were assessed at weeks 0, 12, post-race and 7 days post-race. Performance data was collated from official timing chips. Data presented as mean ±SE.

RESULTS: Mild to moderate GE was prevalent in all groups at baseline (PRO 9.71 ±0.85pg.ml⁻¹, PROglut 9.89 ±1.43 pg.ml⁻¹, CON 9.40 ±0.57 pg.ml⁻¹; P>0.05). Whilst LPS, post intervention, was lower in PROglut there was no significance between groups (9.81 ±1.47pg.ml⁻¹ vs 12.80 ±0.93pg.ml⁻¹ (PRO) vs 11.72 ±1.08 pg.mol⁻¹ (CON); P>0.05). LPS were evidently reduced 6hrs post-race, but not different between groups (PRO: 7.29 ±1.41 pg.ml⁻¹, PROglut: 6.95 ±0.94 pg.ml⁻¹, CON: 9.73
Plasma LPS returned to baseline levels 7 days post-race (PRO 7.60 ±0.95 pg.ml⁻¹, PRO_{glut} 10.41 ±1.04 pg.ml⁻¹, CON 8.57 ±0.75 pg.ml⁻¹; P>0.05). Race performance (hrs:mins) was not significant between groups, despite PRO and PRO_{glut} being ~9hrs faster than CON (41:28±2:31 vs 41:58±4:02 vs 50:43±4:38; P>0.05).

CONCLUSION: Moderate GE was prevalent in all groups pre-race and fell significantly during the short-term recovery period. Despite promising results neither probiotic formula had a significant impact on GE or race performance.