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

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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 ±2.0kg, VO_{2max} 4.2 ±0.1 L.min^{-1}), probiotic with glutamine (PRO_{glut}; 40.5mg.d^{-1} *lactobacillus acidophilus* and 900mg.d^{-1}L-glutamine) (age 39 ±2 yrs., weight 70.6 ±4.8 kg, VO_{2max} 4.0 ±0.2 L.min^{-1}) and control (CON) (age 42±3 yrs., weight 79.2 ±3.8 kg, VO_{2max} 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}, PRO_{glut} 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 PRO_{glut} 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}, PRO_{glut}: 6.95 ±0.94 pg.ml^{-1}, CON: 9.73

±1.39 pg.ml^{-1}; P>0.05).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.