

Assessing the Impact of Probiotic Supplementation and Caloric Periodization on Ultra-endurance Performance and Gastrointestinal Symptoms.

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Beneficial use of probiotic (PRO) interventions on gastrointestinal endotoxemia (GE) prior to an ultra-endurance triathlon has been previously demonstrated. The prevalence of GE (and whether PRO strategies minimise gastrointestinal (GI) symptoms) relating to multi-day ultra-events is less known. Understanding if nutritional periodization strategies confer similar GI benefits also warrants investigation.

PURPOSE: To assess the impact of probiotic supplementation and caloric periodization prior to an extreme ultra-marathon on GI symptoms and race performance.

METHODS: Thirty-eight healthy participants were recruited from entrants of the 2015 Marathon Des Sables (age: 42±9yrs; weight: 77.71±10.31kg; VO_{2max}: 52.58±8.66 mL·kg·min⁻¹), and randomly assigned to either: PRO (100mg.d⁻¹ capsulated *Lactobacillus acidophilus*); CP (caloric periodization of 500kcal above habitual intake on alternate days) or control (CON) for 12 weeks pre-race. Plasma lipopolysaccharides (LPS) via *Limulus* Amebocyte Lysate chromogenic endotoxin quantification were determined at baseline, pre and post-race. Participants graded duration and severity of GI symptoms through daily questionnaires. Performance times were obtained from accumulated race tracking. Data presented as mean ±SE.

RESULTS: Race times (hrs:mins) were 41:28±2:31, 45:12±2:05 and 50:43 ±4:38 for PRO, CP and CON respectively (p>0.05). Overall LPS significantly increased from baseline (10.08±0.53pg.ml⁻¹) to pre-race (13.12±0.74pg.ml⁻¹; p=0.001). Delta LPS pre-race was not different between groups (PRO: 2.94±1.11pg.ml⁻¹; CP: 3.71±1.28pg.ml⁻¹; CON: 2.32±1.26pg.ml⁻¹; p>0.05). Similarly, delta LPS post-race was not different, despite greater reductions in both intervention groups (PRO: -4.57±1.93pg.ml⁻¹; CP: -6.95±1.84pg.ml⁻¹; CON: -2.16±2.21pg.ml⁻¹; p>0.05). GI symptom count favoured PRO

(21.8%) compared with CP (41.6%) and CON (36.6%) respectively ($p=0.001$), although no differences for GI symptom index were reported between groups ($p>0.05$).

CONCLUSIONS: Moderate GE was evident in a UK cohort undertaking a multi-day ultra-marathon. PRO use did not significantly impact on GE prevalence, despite evidence of reduced GI symptoms. Caloric periodization appeared to favour GE recovery post-race, but was not deemed significant.