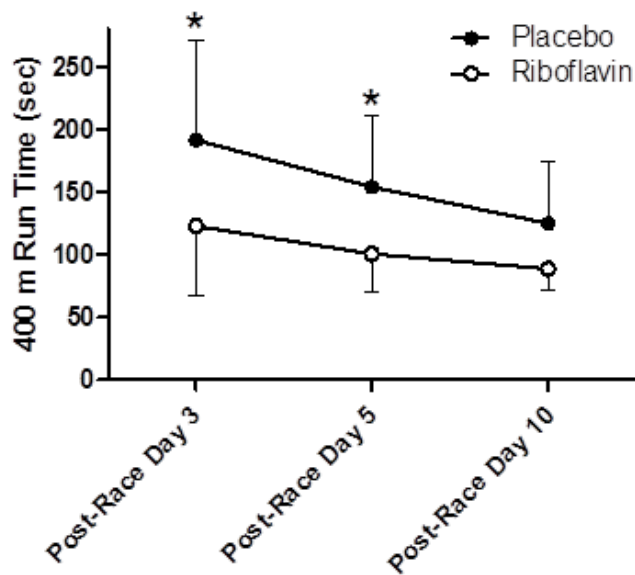
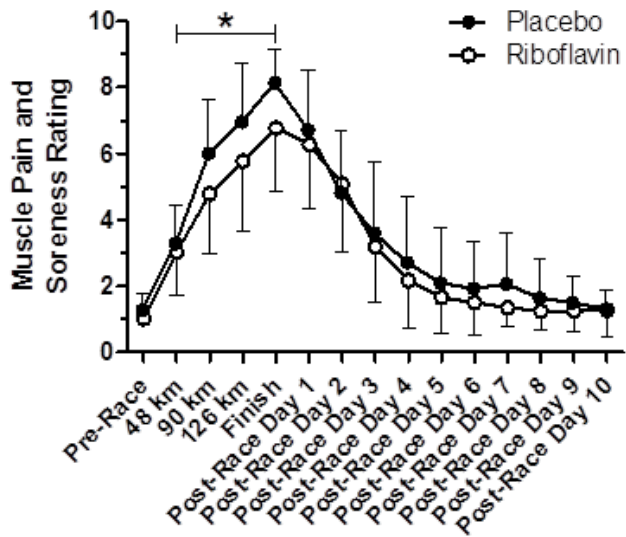


A Randomized Controlled Trial of Riboflavin for Enhancement of Ultramarathon Recovery

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Purpose: This study investigated whether acute ingestion of riboflavin reduces muscle pain and soreness during and after completion of a 161-km ultramarathon, and improves functional recovery after the event. **Methods:** In this randomized, double-blind, placebo-controlled trial, participants of the 2016 161-km Western States Endurance Run were randomized to receive a riboflavin or placebo capsule shortly before the race start and when reaching 90-km. Capsules contained either 100 mg of riboflavin, or 95 mg of maltodextrin and 5 mg of 10% β -carotene. Subjects provided muscle pain and soreness ratings before, during and immediately after the race and for the 10 subsequent days. Subjects also completed 400 m runs at maximum speed on days 3, 5 and 10 after the race. **Results:** For the 32 (18 in riboflavin group, 14 in placebo group) race finishers completing the study, muscle pain and soreness ratings during and immediately after the race were found to be significantly lower ($p=.043$) for the riboflavin group. Analysis of the 400 m run times also showed significantly faster ($p<.05$) times for the riboflavin group than the placebo group at post-race days 3 and 5. Both groups showed that



muscle pain and soreness had returned to pre-race levels by 5 days after the race and that 400 m run times had returned to pre-race performance levels by 10 days after the race.

Conclusion: This work provides preliminary evidence that riboflavin supplementation immediately before and mid-way through prolonged exercise may reduce muscle pain and soreness during and at the completion of the exercise and enhance early functional recovery after the exercise.

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