Introduction

While few clinicians and coaches recommend low-carbohydrate/high-fat eating plans to improve athletic performance, recent published studies have demonstrated their value. Potential benefits include improved training and racing energy through increased fat oxidation, reductions in caloric requirements (food intake) during training and competition, and the reduced incidence of serious gastrointestinal complaints common in competitive athletes. The author has used this approach in a variety of sports for nearly 40 years, and this report is representative of other cases.

Case Report

A 38-year-old female professional triathlete of 13 years began training in January 2015 by reducing carbohydrate and increasing fat intake during regular meals and snacks to improve both health and fitness. Goals included increasing training and racing energy, reducing reliance of exogenous training and race nutrition, and diminishing chronic gastrointestinal problems, which included severe vomiting and bloody diarrhea several times during all previous Ironman events. The macronutrient makeup of the ~2700 kcal diet significantly changed over a 4- to 6-week period to ~12% natural carbohydrate (previously 70-75%), ~13% protein (remaining constant) and ~75% fat. These levels were determined by using various ongoing clinical assessments that included tracking caloric needs during long training sessions, changes in cycling power and running pace at sub-max heart rates, blood tests, breath ketone measurements, and other evaluations. By November 2015, three Ironman triathlon events had been successfully completed. Pre-race meals were approximately 20g carbohydrates, 20g protein and 100g fat (total 1060 kcal). Compared to previous years, race calories consumed were reduced from ~400 per hour to ~130 per hour. No significant gastrointestinal signs and symptoms occurred. Two races were personal best times with the final event completed in 8 hours 52 minutes.

Table 1. Assessment Tools to Help Establish Macronutrient Makeup

<table>
<thead>
<tr>
<th>Tool</th>
<th>Description</th>
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<tbody>
<tr>
<td>Daily hunger, satiety, energy/fatigue</td>
<td>At sub-max HR (MAF Test).</td>
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<tr>
<td>Caloric needs during long training</td>
<td>The Two-Week Test.</td>
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<tr>
<td>Breath and blood ketones.</td>
<td>Other blood tests (fasting glucose, insulin, HbA1c).</td>
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Table 2. Up to 90% of Endurance Athletes have GI Impairment during Races.

- Nausea, bloating, pain.
- Vomiting, abdominal angina, bloody diarrhea.
- Endotoxaemia, hemorrhagic gastritis, ischemic colitis.
- Disaccharides/polysaccharides can increase risk of gut distress.

Table 3. Differentiating Health and Fitness

- Health is a state in which all systems (nervous, hormonal, digestive, etc.) work in harmony.
- Fitness is the ability to be athletic—to apply the body's physical abilities towards achieving exercise goals.

Bibliography


Conclusions

This case report of a professional triathlete demonstrates improved endurance performance, reduced caloric needs and the elimination of serious gastrointestinal signs and symptoms during Ironman distance racing, while maintaining a low-carbohydrate/high-fat ketogenic eating plan.