High intensity intermittent exercise is the most common form of exercise in competitive sport yet dietary factors that affect an athlete’s performance in this capacity are rarely investigated. Purpose: The purpose of this investigation was to see if a 5 d high fat load alters substrate oxidation and performance during high intensity intermittent exercise in trained athletes. Methods: Nine wrestlers at the University of Missouri were given a 5 d supplementation of 2.2 g/Kg/d of olive oil. The subjects were tested on a 40 min intermittent bout of treadmill running at work:recovery ratios of 6:9 s and 24:36 s at speeds that produced an RER between 0.95 and 0.99 while gas was collected, then in elliptical locomotion in which distance traveled (Km) and power output (peak Km/hr) was measured during four separate 8 min maximum:active rest bouts of 15:15 s. Results: Subjects had a greater fat oxidation (4.87% ± 0.07 vs. 11.36% ± 1.06% P < 0.01) after a 5 d high fat load. There was a significant improvement in 8 min high intensity intermittent performance in total distance, sprint distance, and power output (P < 0.01) after the 5 d high fat load. Conclusion: Five days of high fat loading increases fat oxidation without reducing glucose availability and improves performance in high intensity intermittent exercise designed to simulate a wrestling tournament in trained wrestlers.