Muscle Glycogen Loading With a Liquid Carbohydrate Supplement

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This study compared two high carbohydrate (CHO) diets in 14 male runners for effects on muscle glycogen deposition, endurance, and sensation of gastrointestinal discomfort. Muscle glycogen was measured in the vastus lateralis at rest and run time to exhaustion at 75% VO$_{2\max}$ was measured following 3-1/2 days on a 50% CHO diet. After 14 days the subjects consumed a 20% CHO diet and continued training to reduce glycogen. During the next 3-1/2 days, subjects ran less and consumed a 90% CHO diet emphasizing pasta and rice (Pasta, n=7) or lesser amounts of pasta and rice supplemented by a maltodextrin beverage (Supplement, n=7). Glycogen was again measured, followed by a second run to exhaustion. Compared to the 50% CHO diet, Pasta increased muscle glycogen by 27.1 ± 12.2 mmoles/kg muscle (M ± SE; P < 0.05) and run time by 15.7 ± 5.9 min; Supplement increased glycogen by 43.2 ± 13.5 mmoles/kg (P < 0.05) and run time by 29.0 ± 7.4 min (P < 0.05). Total glycogen concentrations and run times were not significantly different for Pasta versus Supplement. Subjects reported less gastrointestinal discomfort and greater overall preference for Supplement than for Pasta. Thus, glycogen loading can be accomplished at least as effectively and more comfortably by substituting a maltodextrin drink for some of the pasta and rice in a glycogen loading diet.