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**The effect of galactose supplementation on endurance cycling performance.**

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**Objectives:** This study tested the hypothesis that supplementation with galactose before and during endurance exercise would spare carbohydrate (CHO), optimize fat utilization and improve performance compared with a typical sports drink formulation. **Subjects:** Nine well-trained cyclists undertook three trials, each consisting of 120 min at 65 VO<sub>2</sub>(max) followed immediately by a set work, self-paced time trial (TT). Three treatments, allocated as a randomized balanced design, consisted of the following: (a) 8% (w/w) solution of galactose (Gal); (b) 8% solution of 50% galactose/50% glucose (Gluc/Gal); and (c) 8% solution of 80% glucose/20% fructose (Gluc/Fru). These were consumed as 0.67 g CHO per kg body wt 45-min pre-exercise; 1.0 g CHO per kg body wt per h for the first 120 min of exercise; 0.33 g CHO per kg body wt during the TT. Blood samples were collected before and during exercise; respiratory gas samples were collected only during fixed workload exercise. **Results:** Mean TT power output was significantly less in Gal compared with Gluc/Gal (P=0.030). Blood glucose and insulin concentrations were lower, and free fatty acids higher in Gal compared with Gluc/Gal and Gluc/Fru. Respiratory exchange ratio was not significantly different between trials. **Conclusions:** Ingestion of an 8% galactose-only solution (12.5 ml per kg body wt per h) is detrimental to endurance performance compared with equivalent volumes of iso-osmotic solutions containing 50% galactose/50% glucose or 80% glucose/20% fructose. This may reflect the inability of the liver to convert galactose into glucose at a rate required to support strenuous exercise intensity. *European Journal of Clinical Nutrition* advance online publication, 10 October 2007;