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Meeting carbohydrate recommendations during a mountain marathon

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Current guidelines recommend athletes consume 30–60 g carbohydrate (CHO) per hour during exercise to delay fatigue and improve performance⁽¹⁾. During mountain marathons; ultra-endurance events where competitors must often carry their own energy provisions, athletes have been shown to consume considerably less than this⁽²⁾. This study investigated the effectiveness of increasing CHO consumption by providing written dietary guidelines to competitors.

An intervention study was performed using male participants entered in the Longmynd Hike (50 mile race). The intervention group [*n* 8, mean age: 42 (SE 4.8) year, BMI: 24.0 (SE 1.2) kg m⁻²] received written dietary advice for CHO consumption and the control group [*n* 8, mean age: 44 (SE 6.2) year, BMI: 24.1 (SE 0.6) kg/m²] received no advice. Participants were assigned to each group by stratified random sampling and completed a weighed food inventory of all items consumed during the event. All data are expressed as means (SE), statistical significance *P* ≤ 0.05.

Total CHO consumption during the event was significantly different between groups (*t* = 2.39, *P* = 0.034). All participants in the intervention group consumed within the recommended range, whereas 62.5% of the control group consumed <30 g CHO h⁻¹. There was no significant difference in overall performance between the intervention and control groups [mean completion time: 17.0 (SD 3.4) h and 16.9 (SD 2.8) h, respectively], however, CHO (g h⁻¹) showed a strong, positive correlation with performance (*r* = 0.622, *P* = 0.017, *n* 16). Percentage of energy and CHO from sports products also showed strong, positive correlations with performance (*r* = 0.556, *P* = 0.039; *r* = 0.650, *P* = 0.012 and *n* 16, respectively) but there was no significant differences in percentages consumed between groups. Total food carried was significantly higher in the intervention group (*t* = 4.06, *P* = 0.003) and higher consumption of protein and overall energy suggest an increase in general food consumption rather than sports-specific, CHO-rich food sources.

		Energy	CHO		Fat	Protein	Sports-specific products		Food carried
		Total (MJ)	Total (g)	(g/h)	Total (g)	Total (g)	Total energy (%)	Total CHO (%)	Total (g)
Intervention group	Mean	15.5	670	40	95	74	21	25	1891
	SE	1.4	42	3.4	22	16	4.8	4.8	260
Control group	Mean	12.1	491	31	93	48	17	23	766
	SE	1.1	62	5.1	11	6	6.9	9.0	97

These findings suggest that written guidelines are effective in helping athletes to meet dietary recommendations but more advice is needed to select appropriate food sources to reduce the weight penalty of carrying extra food. Research is needed to establish the reasons behind the athletes' food choices; further promotion of the benefits of CHO-rich diets and sports products may be useful, or alternatively the development of new products that suit the needs of ultra-endurance athletes, who may limit current usage due to factors such as sweetness and flavour fatigue, may be necessary.

1. American College of Sports Medicine, American Dietetic Association & Dieticians of Canada (2009) Nutrition and Athletic Performance. *Med Sci Sports Exerc* **41**, 709–731.
2. Kruesman M, Bucher S, Bovard M *et al.* (2005) Nutrient intake and performance during a mountain marathon: an observational study. *Eur J Appl Physiol* **94**, 151–157.