47th Annual Scientific Meeting of the Nutrition Society of Australia and Nutrition Society of New Zealand, 28 November – 1 December 2023, Nutrition & Wellbeing in Oceania

Macronutrient intakes of adolescent rowers for growth, development and sports performance

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Dietary intake plays a key role in athletic performance in rowing[1]. Suboptimal nutrition within the adolescent rowing population may negatively affect performance, normal growth and development, professional athlete development, and career longevity. Previous research has indicated that suboptimal carbohydrate intakes are a common issue in rowing[2]. The quality of nutritional intake in adolescent rowers has seldom been explored. During moderate training, adolescent athletes should aim for 5-7g.kg^{-1} of carbohydrates, 1.3-1.8g.kg^{-1} of protein, and 20-35% energy from fat[3]. This study aimed to examine the dietary intake of adolescent rowers in New Zealand and compare it with nutritional guidelines for normal growth, development, and sports performance. A cross-sectional study design involved data collection on two 'hard' training days, and two 'recovery' days from rowers (14-21 years) recruited from clubs and secondary schools around New Zealand. Participants completed four 24-hour collection periods, recording food intake, training duration and intensity. The food records were verified for accuracy, and dietary data was entered into Foodworks software for nutritional analysis. IBM SPSS software was used to calculate mean intakes for carbohydrate, protein, fat, and standard deviations. Independent t-tests were used to compare carbohydrate and protein intakes between males and females. Of the initial 40 participants, 35 fully (n = 23 females, 16.8 ± 1.9 years and n = 12 males, 17.3 ± 1.6 years) completed the study. Participants consumed 319 ± 116g (4.5 ± 1.7g.kg^{-1}/day) of carbohydrates, 121 ± 56 g (1.7 ± 0.7 g.kg^{-1}/day) of protein and 113 ± 46 g (1.6 ± 0.6g.kg^{-1}/day) of fat per day. Females consumed 290 ± 80g (4.4 ± 1.3g.kg^{-1}/day) of carbohydrates and males consumed 400 ± 78 g (5.0 ± 1.4g.kg^{-1}/day) per day, with no significant difference between males and females intake per kilogram of bodyweight per day (p = 0.165). Minimum carbohydrate levels of 5g.kg^{-1} per day were only achieved by 7 females (30.4%) and 4 (33.3%) males. Females consumed significantly less protein per day, 106 ± 38g (1.6 ± 0.6 g.kg^{-1}/day), in comparison to males who consumed 164 ± 46 grams (2.0 ± 0.5 g.kg^{-1}/day) per day (p = 0.04). Fourteen females (60.9%) and 10 males (83.3%) consumed more than the minimum requirement of 1.3g.kg^{-1} of protein per day. The findings suggest that 2 out of 3 adolescent rowers in New Zealand fail to reach the minimum recommendations for carbohydrate intake[3], and males more readily meet the recommended intakes of protein when compared to females. Nutrition education for adolescent rowers in New Zealand should emphasise adequate carbohydrate and protein intakes that meet sports nutrition guidelines in order to support normal growth, development and optimised performance for these athletes.

Keywords: adolescent athletes; sports nutrition guidelines; carbohydrate; protein

Ethics Declaration

Yes

Financial Support

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Proceedings of the Nutrition Society