

Rugby players should aim to consume enough food to meet energy, macronutrient and micronutrient requirements. Failure to do so can negatively impact performance, recovery, health, well-being, cognitive function and may increase injury risk. Provincial academy players in New Zealand typically present congested schedules; alongside developmental rugby athletes will train and play at the local club level and balance study and work commitments. As such, monitoring and management of dietary intake is crucial.

Nine provincial academy rugby union players (age = 20.6 ± 1.7 years, height = 186.3 ± 9.0 cm, body mass = 102.4 ± 18.2 kg, fat free mass = 82.9 ± 12.1 kg) recorded dietary intake over a 4-week pre-season using the remote food photography method. Body composition was assessed via three-dimensional optical scanning.

A total of 76 days were sufficiently logged. A large variability in daily total nutrient intake was observed (Energy = 2550 ± 914 kcal, protein = 135 ± 50 grams, carbohydrate = 270 ± 122 grams, fat = 97 ± 42 grams). Energy intake relative to fat free mass (FFM) was 31 ± 11 kcal.kg FFM. Relative to total body mass, protein intake was 1.3 ± 0.4 grams and carbohydrate intake 2.6 ± 1.3 grams. Requirements for protein and carbohydrates were not met on 49.4 and 96.6% of eating occasions, respectively.

Energy intake relative to FFM did not meet the proposed threshold of 40kcal.kg FFM to ensure optimal energy availability for physiological functions in male athletes [1]; previous research has demonstrated that high-level rugby players may expend 61 kcal.kg FFM daily [2]. Failure to meet the optimal threshold may result in physiological and metabolic dysfunction [3], impairment to adaptive responses to exercise and performance [1,3], increased risk of injury or illness [1,3] and a failure to meet macronutrient and micronutrient requirements [3]. Indeed, relative protein intake was at the low end of recommendations for athletes, potentially compromising FFM during periods of energy deprivation, which may be further exacerbated by inadequate energy intake [1]. Similarly, carbohydrate intake did not meet best-practice sports nutrition recommendations for rugby players.

Developing rugby players should take care to consume a high-quality diet that meets energy and macronutrient requirements to tolerate the demanding nature of the sport, promote adaptation and optimal health and decrease injury risk.

[1] Wasserfurth et al., 2020. Reasons for and consequences of low energy availability in female and male athletes: social environment, adaptations, and prevention. *Sports med*, 6(1), pp.1-14.

[2] Smith et al., 2018. Energy expenditure of rugby players during a 14-day in-season period, measured using doubly labelled water. *Eur jour app phys*, 118(3), pp.647-656.

[3] Logue et al., 2018. Low energy availability in athletes: a review of prevalence, dietary patterns, physiological health, and sports performance. *Sports Med*, 48(1), pp.73-96.