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An evaluation of dietary practices of soccer players from an English Premier League team using a behavioural change science framework

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ABSTRACT

Professional soccer players often fail to meet recommended dietary intakes. Accordingly, we aimed to quantify dietary intake of male English Premier League (EPL) players and explore the enablers and barriers influencing dietary behaviours using the Capability-Opportunity-Motivation and Behaviour (COM-B) model. Ten players from a single EPL club participated. Dietary intakes were assessed using the remote food photography method over a 4-day in-season period comprising a training day, the day before a match (MD-1), match day (MD), and the day after a match (MD + 1). On day 5, dietary recalls and semi-structured interviews were conducted to explore factors influencing dietary behaviours. Relative carbohydrate intake was significantly higher on MD-1 (4.6 ± 0.8 g·kg⁻¹·day⁻¹) than on training days (3.5 ± 0.8 g·kg⁻¹·day⁻¹, $p = 0.019$) and MD + 1 (3.6 ± 0.5 g·kg⁻¹·day⁻¹, $p = 0.013$). Knowledge (psychological capability) was the primary enabler of dietary behaviours. Key barriers included beliefs about consequences (reflective motivation), particularly the desire to feel light before and during matches and suppressed appetite post-match (automatic motivation). Reflective (desire to feel light) and automatic (suppressed appetite) motivation limited fuelling. Although knowledge supported dietary behaviours, targeted behaviour-change interventions beyond education are needed to improve carbohydrate intake.

ARTICLE HISTORY

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KEYWORDS

Dietary behaviours; soccer; performance nutrition; behaviour change

Introduction

In 2020, the Union of European Football Association (UEFA) published an expert consensus statement presenting updated evidence-based nutritional guidelines for elite soccer players. These guidelines recommend that daily carbohydrate (CHO) intake should range from 3 to 8 g·kg⁻¹body mass (BM)·day⁻¹, with adjustments based on the energetic demands and specific goals of the training sessions and the competitive schedule (Collins et al., 2021). For instance, higher CHO intake (6–8 g·kg⁻¹BM·day⁻¹) are advised on the day before the match (MD-1), match day (MD) and the day after the match (MD + 1) to optimise muscle glycogen availability for performance and recovery. Conversely, on lower absolute daily load days such as typical training days during a one game per week microcycle, lower CHO intakes ranging from 3 to 6 g·kg⁻¹BM·day⁻¹ are likely sufficient to support fuelling and recovery needs (Collins et al., 2021). Additionally, current guidelines recommend that soccer players consume 1.6 to 2.2 g·kg⁻¹BM·day⁻¹ of protein, distributed evenly across four or five servings per day, each providing 0.4 g·kg⁻¹BM per serving. Regarding dietary fat, an intake ranging

from 20 to 35% of total energy intake is advised, with an emphasis on limiting the consumption of saturated fats.

Despite the widespread recognition of the importance of nutrition in elite soccer, dietary assessments of elite soccer players, albeit using self-report methods, consistently indicate a mismatch between evidence-based recommendations and players' habitual practices. While dietary protein and fat intake are typically adequate, CHO consumption frequently falls short of recommendations (Danielik et al., 2022; Steffl et al., 2019). A study conducted on English Premier League (EPL) soccer players, for example, reported inadequate CHO intake on the day before the match (MD-1), the day following the match (MD + 1) and in the immediate post-match recovery period, compromising muscle glycogen resynthesis (Anderson, Orme, et al., 2017; a; Burke et al., 2017), particularly in type II muscle fibres (Ermidis et al., 2024; Gunnarsson et al., 2013). Such deficiencies have been linked with reductions in total distance covered and average speed in subsequent matches (Ermidis et al., 2024). Moreover, CHO consumption during match play was recently shown to be below

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recommended levels (Kasper et al., 2024), despite strong evidence that in-game CHO ingestion enhances soccer-specific performance outcomes, including dribbling speed (Harper et al., 2017), passing accuracy (Rodriguez-Giustiniani et al., 2019) and high-intensity intermittent running capacity (Foskett et al., 2008). Collectively, these findings highlight a persistent gap between research and practice, suggesting the need to better understand the nutritional behaviours of elite soccer players and the factors influencing them.

Dietary behaviours of elite soccer players are inherently complex, shaped by cultural norms, situational constraints and individual preferences (Foo, Tester, et al., 2025; Pelly et al., 2022). In this regard, the COM-B model (Michie et al., 2011) has been applied within professional sport contexts (Carter et al., 2024; Thompson et al., 2026) to facilitate the understanding of dietary behaviours of athletes and the development of effective behaviour change interventions. The COM-B model is a meta-theoretical framework that conceptualises behaviour as part of an interacting system, recognising that athletes are embedded within social and physical environments (Michie et al., 2011). According to this model, engagement in a specific behaviour, requires sufficient psychological (e.g., knowledge) and physical capability (e.g., skills), appropriate social (e.g., interpersonal influences and cultural norms) and physical (e.g., time, resources and environments) opportunity and both automatic (e.g., emotion, desires and impulses) and reflective (e.g., self-conscious planning and beliefs) motivation to prioritise that behaviour over competing alternatives. This framework is particularly relevant in professional soccer, where players' dietary behaviours are influenced not only by nutritional knowledge (Noronha et al., 2020), but also by food availability and the prevailing social and cultural norms within the sport (opportunity) (Ono et al., 2012; Foo, Tester, et al., 2025), as well as various motivational drivers such as performance and body image (motivation) (Carter, Lee, Ranchordas, et al., 2023; McHaffie et al., 2022). To further understand these behavioural determinants, the COM-B components can be further elaborated using the Theoretical Domains Framework (TDF), which comprises 14 domains synthesised from 128 constructs taken from 33 theories of behaviour change (Cane et al., 2012).

Application of the COM-B framework within professional soccer has highlighted a range of context-specific barriers. Among female soccer players, a fear of weight gain was associated with reduced CHO intake, thus presenting reflective motivation (i.e., negative beliefs about consequences) as a key barrier (McHaffie et al., 2022). These beliefs were further exacerbated by external pressures arising from social

media, coaches and the culture surrounding body composition, i.e., social opportunity (McHaffie et al., 2022). In contrast, a study of male youth soccer players has identified physical opportunity as the key barrier to nutritional adherence, including inadequate food provision within training and home environment and limited access to nutritionist support (Carter, Lee, Ranchordas, et al., 2023). From practitioners' perspectives, barriers to implementing UEFA nutritional guidelines have been linked to restricted physical opportunity (i.e., limited time for players support) and psychological capability (i.e., difficulties in changing players' dietary behaviours) (Costello et al., 2025). Additionally, reflective motivation barriers including doubts regarding practicality of CHO guidelines and scepticism surrounding body composition guidelines have also been reported (Costello et al., 2025). Despite this growing body of literature, there remains a lack of research examining the barriers and enablers underpinning dietary behaviours in male English Premier League (EPL) soccer players, particularly through approaches that first measures dietary practices and then explore the underlying reasons and influencing factors. Given the persistent suboptimal adherence to nutritional guidelines among professional soccer players despite advances in nutritional support, there is a clear need to develop a more nuanced and contextually grounded understanding of dietary behaviours within elite soccer.

With this in mind, this study had two primary objectives: (1) to quantify the energy and macronutrient intake and distribution across meals on training days, MD-1, MD and MD + 1; and (2) to apply the COM-B model as a framework to explore the factors underpinning the dietary practices of EPL male players. To this end, dietary intake was assessed over four consecutive days during the in-season via the RFPM, followed by dietary recall on the fifth day, which also included a semi-structured interview to explore the players' perspectives on factors influencing their dietary behaviours over the four days.

Methods

Participants

Ten male soccer players from the first team squad of an EPL soccer club volunteered to take part in this study. Participant characteristics were presented in Table 1. Written informed consent was obtained from all participants. Ethical approval was granted by the Liverpool John Moores University Ethics Committee, UK (REC approval number: 24/SPS/049).

Table 1. Baseline characteristics of the participants.

Participant	Age	Height (cm)	Body Mass (kg)	Playing Position	EPL Appearances	Starter or Substitute	Match Minutes
1	27	189	83.4	Forward	163	Starter	96
2	19	187	78.4	Midfielder	30	Starter	96
2	28	195	90.2	Goalkeeper	68	Starter	96
4	23	192	88.8	Defender	25	Starter	94
5	22	186	88.8	Defender	57	Starter	82
6	19	187	81.6	Midfielder	33	Substitute	20
7	33	181	78.0	Defender	313	Starter	98
8	18	184	79.0	Wide Midfielder	12	Starter	95
9	19	189	81.5	Forward	3	Substitute	13
10	22	191	89.8	Goalkeeper	6	Starter	99
Mean	23 ± 4	188 ± 4	84.0 ± 5.0		71 ± 97		79 ± 33

Study design

In a mixed methods observational design, players' self-reported energy and macronutrient intakes were assessed over a four consecutive day in-season period, starting from a training day (two days before the match, MD-2), the day before the match (MD-1), match day (MD) and the day after the match (MD + 1), followed by a dietary recall on the fifth day, which also included a structured interview to explore the players' perspectives on factors influencing their dietary behaviours over the four days. During this time, all players continued with their usual training schedules. An example of daily schedule is displayed in [Table 2](#).

Quantification of energy and macronutrient intakes

Energy and macronutrient intake were measured via remote food photography method (RFPM) (Martin et al., 2009) and weighed food inventory. Prior to the data collection, participants were briefed individually about the process of collecting dietary intake using RFPM. The individual briefing session was delivered by the principal investigator who is accredited by the Sport and Exercise Nutrition Register (SENr) and has four years of experience working with professional soccer players. Firstly, at breakfast and lunch, the dietary intake was assessed via weighed food inventory, which has been previously used alongside DLW with professional soccer players (Morehen et al., 2022). As a menu-based system is utilised in the club, the main meals were weighed with a calibrated weighing scale (Model 405, Salter Brecknell Weighing, West Midlands, United Kingdom) before serving to the participants. Participants subsequently used the RFPM to self-report additional food items consumed at mealtimes (e.g., salad, fruits, beverages, etc.) and any foods consumed for dinner and snacks. The RFPM had previously employed by this research group within this population (Foo, Hambly, et al., 2025).

When using the RFPM to assess all food and drink they consume, participants are required to take a photo

prior to consumption at 90° angle. Participants then sent a short description of the food within the images to the principal investigator on a smartphone via WhatsApp. The aim of the short description was to provide the principal investigator with as many details as possible (i.e., information on quantities, brands, preparation and cooking methods) to assist with the accuracy of the data analysis. Furthermore, most meals were consumed under the supervision of club nutritionists, including a registered dietitian and a SENr-Practitioner registrant, who provided support to players in accurately documenting meal details and capturing food photographs. Additionally, 24-h recall was performed with all participants on the day after each dietary assessment using the triple-pass method to ensure players did not omit any foods/drinks and to cross-check the two sources of dietary intake information (Capling et al., 2017). Dietary intake was analysed by the principal investigator using the dietary analysis software (Nutritics v5, Dublin, Ireland), which calculates the energy and macronutrient intake for each participant. The estimated EI was reported in kilocalories per day ($\text{kcal}\cdot\text{day}^{-1}$) and macronutrient intake was reported in grams per day ($\text{g}\cdot\text{day}^{-1}$) and grams per kilogram BM per day ($\text{g}\cdot\text{kg BM}^{-1}\cdot\text{day}^{-1}$).

Dietary behaviours interview

All participants completed a semi-structured interview the day after finishing the RFPM. The purpose of this interview was to explore the dietary behaviours observed over the preceding four days. During the interview, participants were shown images from the 4-day RFPM and engaged in semi-structured, open-ended discussions (Gall et al., 2007). Questions were delivered in a conversational and informal manner to encourage voluntary input and detailed responses (Lincoln & Guba, 1985). The interview questions were informed by the study aims and underpinned by the COM-B model. To achieve this, for each player at each mealtime the interview explored: 1) what was consumed (food and drink), 2) where did this occur, 3) who was involved or

Table 2. Example schedule of a professional soccer player on a training day, MD-1, MD and MD + 1.

Time	Types of Day			
	Training Day	MD-1	MD	MD +1
08:30	08:30–09:30: Breakfast	08:30–09:30: Breakfast	08:30–09:30: Breakfast	08:30–09:00: Fasted Blood Biomarkers Test
09:00				09:00 – 09:30: Breakfast
09:30				
10:00	10:00: Individual Treatment	10:00: Individual Treatment		10:00: Individual Treatment
10:30	10:30: Pre-activation	10:30: Team Meeting		10:30: Team Meeting
11:00	10:50: Team Training	11:00 pre-activation		11:00: Recovery Session (Bike Mobility, Ice Bath, Massage, Pool Mobility, Sauna)
11:30		11:30: Team Training	11:30: Report to the Stadium	
12:00			12:00–13:00: Pre Match Meal	
12:30	12:30: Gym			12:30: Upper Body Gym Session
13:00	13:00–14:30: Lunch	13:00: Individual Recovery (Massage, Ice Bath, Sauna, Pool Mobility)	13:00: Team Meeting	13:00–14:30: Lunch
13:30		13:30–14:30: Lunch		
14:00			14:10: Pre-Activation and Warm Up	
14:30	14:30: Media Appearances	14:30: Individual Video Analysis	15:00–17:00: Match	
15:00				
15:30				
16:00	16:00: Afternoon Snacks	16:00: Afternoon Snacks		16:00: Afternoon Snacks
16:30				
17:00			17:00: Post Match Recovery Shake	
17:30			17:30: Media Duties/ Anti-Doping Test	
18:00			18:00: Post Match Meal	
18:30				
19:00	19:00: Dinner	19:00: Dinner		19:00: Dinner
19:30				
20:00				
20:30				
21:00			21:00: Evening Snacks	
21:30				
22:00	22:00: Evening Snacks	22:00: Evening Snacks	22:00: Bedtime	22:00 Evening Snacks
22:30				
23:00	23:00: Bedtime	23:00: Bedtime		23:00: Bedtime

influenced the provision and 4) the reasons for dietary choice. All interviews were audio-recorded and transcribed verbatim. Data were subsequently analysed deductively using the COM-B model as a framework (Michie et al., 2011), with participants' responses coded to the relevant COM-B components and further classified as either enablers or barriers to adherence to nutritional recommendations. To provide a more nuanced understanding of dietary behaviour, the TDF was applied to further elaborate on the COM-B components using the mapping described in Cane et al. (2012). Each response could receive more than one code. This analytical process was conducted on a meal-by-meal basis to account for the contextual differences and meal-specific influencing factors. Data are presented as the proportion (%) of responses per meal, attributable to each COM-B component and categorised as either an enabler or barrier. To enhance the rigour, the final author (JPM), unacquainted with the club and not involved in the interview process, acted as a 'critical friend', who independently checked and challenged data analysis and presentation of

selected quotes (Smith, 2018). Additionally, the critical friend independently reviewed and challenged the categorisation of COM-B components assigned to each enabler and barrier identified for each meal. The role of critical friend is not to seek agreement or consensus but to encourage reflexivity by questioning the interpretations and constructions of knowledge (Cowan & Taylor, 2016). While the lead author's role within the club and personal interest in the topic inevitably introduced subjectivity, this insider perspective was considered advantageous for contextual understanding and rapport building. The involvement of the critical friend, who interrogated and challenged analysis, helped ensure balance between insider insight and analytic rigour (Austin & Sutton, 2014).

Statistical analysis

All data were initially assessed for normality of distribution using Shapiro-Wilk's test. Differences in daily energy and macronutrient intakes were analysed using one-way

repeated measures ANOVA. When there was a significant ($p < 0.05$) effect of 'day', Bonferroni post hoc pairwise comparisons were performed to identify which day differed. Cohen's d effect sizes (ES) for the pairwise comparisons on variables where significant interaction effects were observed (e.g., absolute and relative CHO and PRO) were calculated and interpreted as follows: trivial (≤ 0.20), small (0.20–0.59), medium (0.60–1.19), large (1.20–1.99), and very large (≥ 2.00) (Hopkins et al., 2009). Ninety-five percent confidence interval (95%CI) for the differences are also presented. All statistical analyses were completed using SPSS (version 29, SPSS, Chicago, IL) where $p < 0.05$ is indicative of statistical significance. Data are presented as mean $\pm$ standard deviation (SD).

Results

Self-report energy and macronutrient intakes

There were no significant differences in absolute and relative EI between MD-1 (3314 ± 292 kcal·day⁻¹, 40 ± 5 kcal·kg BM⁻¹·day⁻¹), MD (2810 ± 573 kcal·day⁻¹, 34 ± 8 kcal·kg BM⁻¹·day⁻¹), MD + 1 (2921 ± 427 kcal·day⁻¹, 35 ± 4 kcal·kg BM⁻¹·day⁻¹) and training day (2830 ± 395 kcal·day⁻¹, 34 ± 5 kcal·kg BM⁻¹·day⁻¹) (all $p > 0.05$; Figure 1(A,B)). Total absolute CHO intake was significantly higher on MD-1 (381 ± 49 g·day⁻¹), in comparison to training day (289 ± 58 g·day⁻¹, 95% CI of mean difference = 18 to 167 g·day⁻¹, ES = 1.32, $p = 0.014$) and MD + 1 (301 ± 40 g·day⁻¹, 95% CI of mean difference = 20 to 140 g·day⁻¹, ES = 1.42, $p = 0.009$) and moderately but not significantly different from MD (321 g·day⁻¹, 95%CI of mean difference = -25 to 145 g, ES = 0.75, $p = 0.250$) (Figure 1(C)). Relative to BM, CHO intake was also significantly higher on MD-1 (4.6 ± 0.8 g·kg BM⁻¹·day⁻¹) when compared to training day (3.5 ± 0.8 g·kg BM⁻¹·day⁻¹, 95% CI of mean difference = 0.2 to 2.1 g·kg BM⁻¹·day⁻¹, ES = 1.27, $p = 0.019$) and MD + 1 (3.6 ± 0.5 g·kg BM⁻¹·day⁻¹, 95% CI of mean difference = 0.2 to 1.8 g·kg BM⁻¹·day⁻¹, ES = 1.35, $p = 0.013$) and moderately but not statistically different from MD (3.9 ± 1.2 g·kg BM⁻¹·day⁻¹, 95%CI of mean difference = -0.3 to 1.7 g·kg BM⁻¹·day⁻¹, ES = 0.70, $p = 0.321$) (Figure 1(D)).

Total absolute protein intake was significantly lower on MD (136 ± 40 g·day⁻¹) when compared to MD-1 (190 ± 32 g·day⁻¹, 95% CI of mean difference = -86 to -21 g·day⁻¹, ES = -1.74, $p = 0.002$) and a moderate but not significant difference was observed when compared to training day (177 ± 18 g·day⁻¹, 95%CI of mean difference = -90 to 8 g, ES =

0.89, $p = 0.120$) and MD + 1 (177 ± 18 g·day⁻¹, 95%CI of mean difference = -91 to 5 g, ES = -0.96, $p = 0.086$) (Figure 1(E)). Similarly, total relative protein intake was also lower on MD (1.6 ± 0.5 g·kg BM⁻¹·day⁻¹) when compared to MD-1 (2.3 ± 0.5 g·kg BM⁻¹·day⁻¹, 95% CI of mean difference = -1.1 to -0.2 g·kg BM⁻¹·day⁻¹, ES = -1.60, $p = 0.004$) and moderately but not significantly different from training day (2.1 ± 0.1 g·kg BM⁻¹·day⁻¹, 95%CI of mean difference = -1.1 to 0.1 g·kg BM⁻¹·day⁻¹, ES = -0.92, $p = 0.104$) and MD + 1 (2.1 ± 0.2 g·kg BM⁻¹·day⁻¹, 95%CI of mean difference = -1.1 to 0.1 g·kg BM⁻¹·day⁻¹, ES = -0.95, $p = 0.091$) (Figure 1(F)). There were no significant differences in absolute and relative fat intakes between MD-1 (116 ± 20 g·day⁻¹, 1.4 ± 0.2 g·kg BM⁻¹·day⁻¹), MD (109 ± 31 g·day⁻¹, 1.3 ± 0.4 g·kg BM⁻¹·day⁻¹), MD + 1 (113 ± 29 g·day⁻¹, 1.3 ± 0.3 g·kg BM⁻¹·day⁻¹) and training day (109 ± 27 g·day⁻¹, 1.3 ± 0.3 g·kg BM⁻¹·day⁻¹) (all $p > 0.05$; Figure 1(G,H)).

Distribution of macronutrients across meals

Overview of macronutrients distribution is presented in Figure 2. The distribution of macronutrients is similar on training days and MD + 1, with mean relative CHO intake between 0.8 to 1.0 g·kg BM⁻¹ at main meals (breakfast, lunch and dinner), 0.3 to 0.4 g·kg BM⁻¹ post training, 0.6 g·kg BM⁻¹ at afternoon snacks and 0.2 g·kg BM⁻¹ at evening snacks. On MD-1, higher relative CHO intake between 1.0 to 1.3 g·kg BM⁻¹ was observed at main meals (breakfast, lunch and dinner). Similarly, relative CHO intake was also higher post training (0.4 ± 0.2 g·kg BM⁻¹), afternoon snacks (0.8 ± 0.4 g·kg BM⁻¹) except evening snacks (0.1 ± 0.1 g·kg BM⁻¹). On MD, the mean relative CHO at pre match (0.9 ± 0.3 g·kg BM⁻¹) is lower than the recommended intake of 1 to 4 g·kg BM⁻¹. Similarly, CHO intake during match (24.1 ± 14.9 g·h⁻¹) was lower than the recommended intake of 30 to 60 g·h⁻¹. Immediate post-match CHO intake (0.8 ± 0.6 g·kg BM⁻¹) was also lower than the recommended intake of 1 g·kg BM⁻¹. The subsequent relative CHO intake at post-match recovery meal (PMRM) (0.8 ± 0.4 g·kg BM⁻¹) also fall short of the recommended intake of 1 g·kg BM⁻¹·h⁻¹ for the first four hours following the match.

Relative dietary protein intake was comparable across training days, MD-1 and MD + 1, with mean values ranging from 0.4 g·kg BM⁻¹ at breakfast, 0.2 to 0.3 g·kg BM⁻¹ post training, 0.5 to 0.7 g·kg BM⁻¹ at lunch, 0.2 to 0.3 g·kg BM⁻¹ at afternoon snacks, 0.6 to 0.7 g·kg BM⁻¹ at dinner and 0.2 to 0.3 g·kg BM⁻¹ at evening snacks. On MD, protein intake ranged from 0.2 to 0.6 g·kg BM⁻¹ across breakfast, lunch,

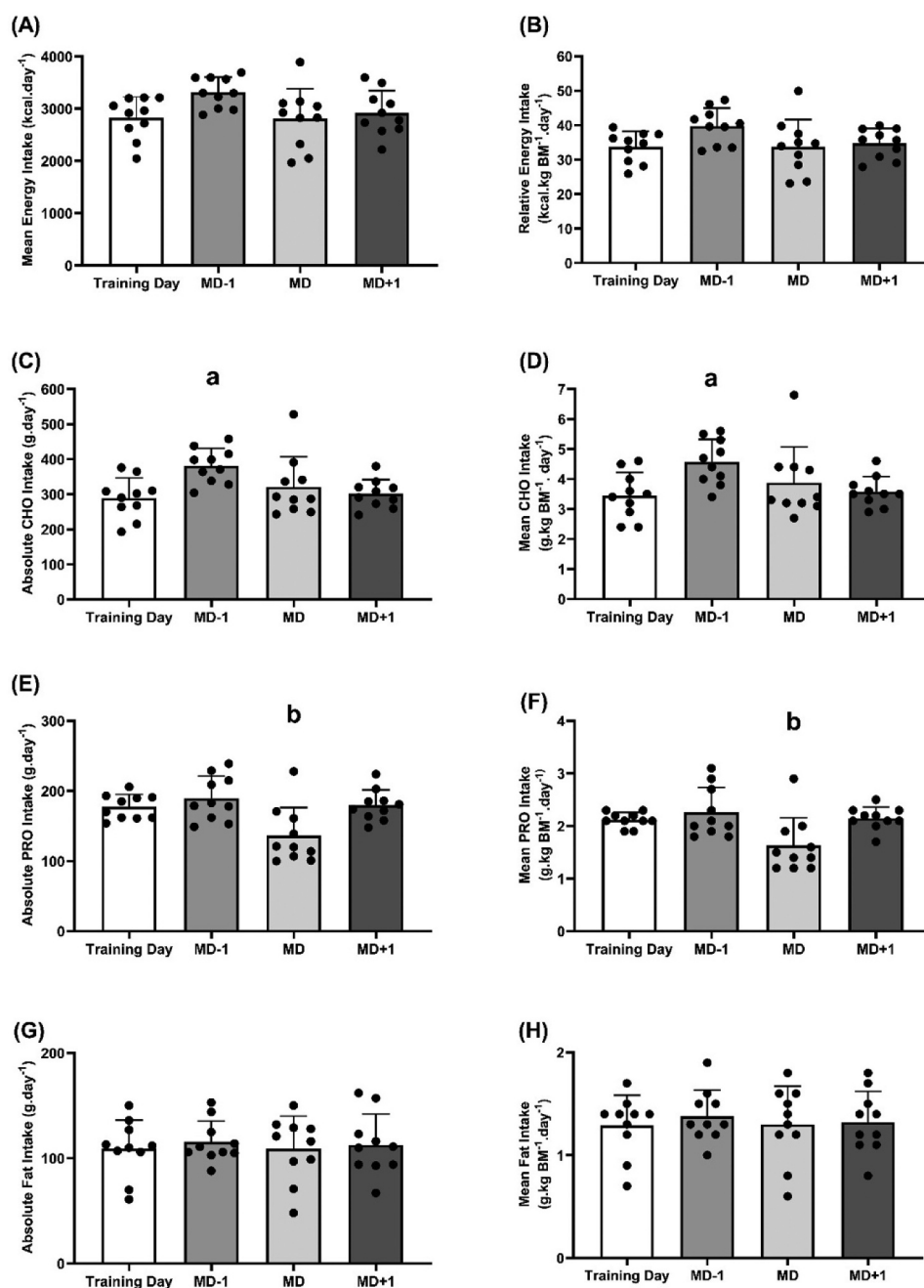


Figure 1. Self-reported mean absolute and relative energy (A & B), absolute and relative carbohydrate (C & D), absolute and relative protein (E & F) and absolute and relative fat (G & H) intakes on MD-1, MD, MD + 1 and training day. ^aSignificantly higher on MD-1 than MD + 1 and training day ($p < 0.05$). ^bSignificantly lower on MD than MD-1.

pre-match, post-match, PMRM and evening snacks, with no protein consumed during match play. Dietary fat intake was higher at main meals including breakfast, lunch, pre match, post-match, PMRM and dinner, ranging from 0.2 to 0.5 g.kg BM⁻¹ across training days, MD-1, MD and MD + 1, compared with lower intakes post-training, afternoon snacks and evening snacks (0.0 to 0.2 g.kg BM⁻¹).

COM-B analysis of each mealtime

The COM-B analysis of each mealtime from the perspective of the players is displayed in [Tables 3–6](#). In total, 195 meals were analysed, with the subsequent frequency analysis of COM-B components for each mealtime displayed in [Figures 3–6](#). To provide deeper insight into the enablers and barriers underpinning players' dietary behaviours, illustrative participant quotes are presented below.

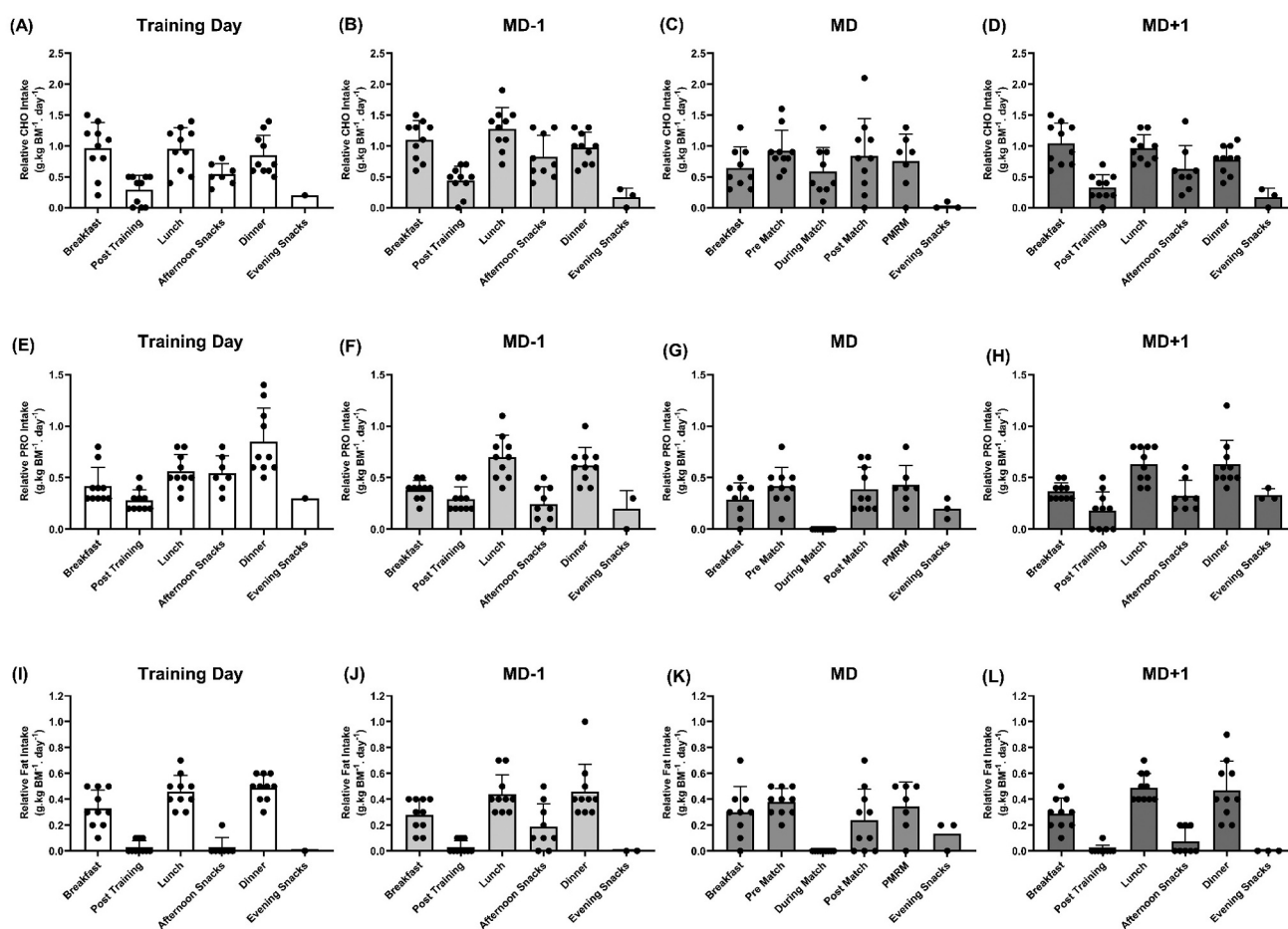


Figure 2. Relative carbohydrate, protein and fat intake meal distribution on training days (A, E, I), MD-1 (B, F, J), MD (C, G, K) and MD + 1 (D, H, L).

Training day

On training days, reflective motivation ('beliefs about consequences') emerged as the main barrier at breakfast (60%). The majority of the players preferred foods that were easily digestible in order to preserve a feeling of lightness before training:

[Participant 3] "I always just have it and that's what I comfortable with, I feel like it doesn't upset my stomach".

[Participant 10] "I always have something that can digest fast before I train so it's easy for me".

Following training, the main enabler was psychological capability ('knowledge') (70%), with most players recognising the importance of protein for post-training recovery. For instance, Participant 3 mentioned that 'I think after training, it's important to have protein, it's an important time to have it'. Similarly, psychological capability ('knowledge') (60%) was also the main enabler at lunch, with players demonstrating an understanding of CHO periodisation. Participant 7 explained:

It depends on the training day; it's a pretty hard training day then I will have good amount of carbs and protein. I know how to adapt the amount of carbs basically. That also depends on whether I will play or not in the next couple of days.

At lunch, automatic motivation ('emotion') (20%) emerged as a potential barrier, as described by Participant 1, 'I'm picking it depending on how I am feeling'. In contrast, for afternoon snacks, automatic motivation ('emotion') (44%) emerged as the main enabler as Participant 7 described that 'I usually have yogurts or protein bar usually because I'm hungry'. Reflective motivation ('belief about consequences') (44%) was another enabler at afternoon snacks with Participant 4 stating 'I think it's a good snack in between lunch and dinner'.

For dinner, social opportunity ('social influences') (40%) was the main enabler. Players described reliance on others to support appropriate food provision:

[Participant 5] "The chef will follow the plan provided by the nutritionist".

Table 3. COM-B analysis for all the meals on training days.

Location	COM-B	COM-B Construct	TDF Construct	Frequency of Barrier or Enabler	Sample Quotations
BREAKFAST					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (50%)	'I'll get carbs to fuel me for training with the two slices of bread and beans for the protein for the recovery purposes'
	Motivation	Automatic	Emotion	Enablers (30%)	'I always have the same breakfast because I like it'
		Reflective	Beliefs about consequences	Enablers (20%) Barriers (40%)	'I always have something that can digest fast before I train so it's easy for me. It provides me with a lot of carbs and also protein' 'I don't like to eat eggs, porridge makes me feel lighter'
POST TRAINING					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (70%)	'I know I need to get 150–200 g of protein, which is about 2 g/kg. Also, I know protein help muscles to recover faster'
	Opportunity	Physical	Environmental Constructs	Enablers (30%)	'I have the protein shake because it's there for me'
		Social	Social Influences	Enablers (10%)	'It's good for recovery and I trust the nutritionist'
	Motivation	Automatic	Emotion	Enablers (10%) Barriers (10%)	'I'm drinking it to recover and to go again as I might do a bit of gym before I have lunch. When you come in, you're quite hungry as well' 'It depends on how I feel after the training session; I only have it when I feel weak after training'
LUNCH					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (60%)	'It depends on the training day; it's a pretty hard training day then I will have good amount of carbs and protein. I know how to adapt the amount of carbs basically. That also depends on whether I will play or not in the next couple of days'
	Motivation	Reflective	Beliefs about consequences	Enablers (20%)	'I enjoyed it and also feel comfortable with the foods, and it doesn't upset my stomach. It got all the nutrients that I need'
		Automatic	Emotion	Enablers (20%)	'I'm picking it depending on how I am feeling'
AFTERNOON SNACKS					
Home (n = 9)	Capability	Psychological	Knowledge	Enablers (33%)	'I have fruits so I've enough fruits for the day, also Greek Yogurt as well because it's low fat and high protein'
	Opportunity	Social	Social Influences	Enablers (11%)	When I'm home, my chef will give me the snacks
	Motivation	Reflective	Beliefs about consequences	Enablers (44%)	'It's just I found to be good since I've been here'
		Automatic	Emotion	Enablers (44%)	'I usually have yogurts or protein bar usually because I'm hungry'
DINNER					
Home (n = 8) Host Family Accommodation (n = 2)	Capability	Psychological	Knowledge	Enablers (30%)	'It depends on whether I will play or not in the next few days. If I know that I'm going to play, then I will ramp up the carbs'
	Opportunity	Social	Social Influences	Enablers (40%)	'I'll just eat what my dig lady cooks for me, she had a lot of nutritional meeting with nutritionists, so she knew what to cook on different types of day. She always gets it spotted on'
	Motivation	Automatic	Emotion	Enablers (30%)	'It pretty much always pasta and chicken breast. Tomato pasta or ragu pasta, depends on my mood'
EVENING SNACKS					
Home (n = 3)	Capability	Psychological	Knowledge	Enablers (100%)	'It's just another way to get protein before I go to bed'

[Participant 9] *"I'll just eat what my dig lady cooks for me, she had a lot of nutritional meeting with nutritionists, so she knew what to cook on different types of day. She always gets it spotted on".*

At evening snacks, psychological capability ('knowledge') (100%) was the main enabler with Participant 3 explaining *'It's just another way to get protein before I go to bed'*.

MD-1

On MD-1, psychological capability ('knowledge') (50%) emerged as the primary enabler at breakfast. Players demonstrated awareness of the need to maximise CHO

availability on the day before the match. For instance, Participant 9 stated that *'On MD-1, you want to get as much CHO as you can, obviously during the game you'll burn it all, so it's about CHO loading'*. Similarly, 'knowledge' (70%) was the key enabler at post-training with Participant 8 mentioning that *'protein shake is a quick way to get protein, it's easy way to get protein. It got creatine in there as well which is good for your body'*. At lunch, psychological capability ('knowledge') (50%) continued to act as a key enabler, as players acknowledged the importance of increasing CHO intake:

[Participant 8] *"I like to fill out at my lunch on the day before as on game day I don't like to eat as much. The day before I would like to have a bigger portion at lunch".*

[Participant 9] *"I focus on getting more carbs on MD-1 to prepare me for the game".*

However, reflective motivation ('beliefs about consequences') (20%) was identified as a barrier at lunch, with some players preferring familiar foods. As

Participant 3 explained, *'I always stick to the foods that I'm comfortable with on MD-1'*. For afternoon snacks, automatic motivation ('emotion') (56%) emerged as the main driver of dietary behaviour, with Participant 9 noting that *'It makes me feel quite full and I quite enjoyed it as well because it's nice'*. At dinner, psychological capability ('knowledge') (60%) again functioned as the main enabler, with players intentionally increasing CHO intake:

Table 4. COM-B analysis of meals on MD-1.

Location	COM-B	COM-B Construct	TDF Construct	Frequency of Barrier or Enabler	Sample Quotations
BREAKFAST					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (50%)	‘On MD-1, you want to get as much carbs as you can, obviously during the game you’ll burn it all, so it’s about carbo loading’
	Motivation	Automatic	Emotion	Barriers (20%)	‘I always have the same breakfast because I like it’
		Reflective	Beliefs about consequences	Enablers (20%) Barriers (30%)	‘It gives me energy and it’s healthy as well’ ‘I always just have it and that’s what I comfortable with, I feel like it doesn’t upset my stomach’
POST TRAINING					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (70%)	Protein shake is a quick way to get protein; it’s easy way to get protein. It got creatine in there as well which is good for your body
	Opportunity	Physical	Environmental Constructs	Enablers (30%)	‘I’m drinking the shake because it’s there’
		Social	Social Influences	Enablers (10%)	‘It’s good for recovery and I trust the nutritionist’
	Motivation	Automatic	Emotion	Enablers (10%) Barriers (10%)	‘I’m drinking it to recover and to go again as I might do a bit of gym before I have lunch. When you come in, you’re quite hungry as well’ ‘It depends on how I feel after the training session; I only have it when I feel weak after training’
LUNCH					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (50%)	‘I focus on getting more carbs on MD-1 to prepare me for the game’
	Motivation	Reflective	Beliefs about consequences	Enablers (20%)	‘I always have rice, red pesto and salmon because it makes me feel comfortable’
		Automatic	Emotion	Enablers (50%)	‘I usually have a bigger meal at lunch and dinner on MD-1’
AFTERNOON SNACKS					
Home (n = 9)	Capability	Psychological	Knowledge	Enablers (11%)	‘I will have the fruits with yogurt or protein pudding to stop the hunger. If the training session was hard, I will put extra oats and extra half scoop of protein’
	Opportunity	Social	Social Influences	Enablers (11%)	‘I will have the snacks when my chef makes them’
	Motivation	Reflective	Beliefs about consequences	Enablers (56%)	‘I always stick to the foods that I’m comfortable with on MD-1’
		Automatic	Emotion	Enablers (44%)	‘I’m freer with the snacks, I like to have sweet snacks in the afternoon because I eat salty foods at main meals’
DINNER					
Home (n = 8) Host Family Accommodation (n = 2)	Capability	Psychological	Knowledge	Enablers (50%)	‘It depends on how much involvement I have on match day. It can be anything as long as I hit my macronutrients target’
	Opportunity	Social	Social Influences	Enablers (10%)	“‘I’ll just eat what my dig lady cooks for me, she had a lot of nutritional meeting with nutritionists, so she knew what to cook on different types of day. She always gets it spotted on’
	Motivation	Reflective	Beliefs about consequences	Enablers (10%)	‘In the last year or two, that’s what I had before every game, I feel that it works for me’
		Automatic	Emotion	Enablers (30%)	‘I will always have rice or pasta with chicken or meat and some vegetables. I don’t think about the portion as much’
EVENING SNACKS					
Home (n = 3)	Capability	Psychological	Knowledge	Enablers (100%)	‘It’s just another way to get protein before I go to bed’
	Motivation	Automatic	Emotion	Enablers (33%)	“‘I’ll have an extra snack, whatever I’m feeling to eat a little more before the energv”

[Participant 2] “At dinner, I will eat a bit more CHO than normal day”.

[Participant 3] “I try to get more carbs in towards the night on MD-1.”

Evening snacks were also driven entirely by psychological capability (‘knowledge’) (100%). Participant 3 mentioned that “I ‘ll have an extra snack, whatever

I’m feeling to eat a little more energy”. However, only three players reported consuming evening snacks on MD-1, indicating a potential opportunity to further increase CHO intake.

MD

On MD, reflective motivation (‘beliefs about consequences’) (63%) emerged as the primary barrier to

Table 5. COM-B analysis on MD.

Location	COM-B	COM-B Construct	TDF Construct	Frequency of Barrier or Enabler	Sample Quotations
BREAKFAST					
Home (n = 5)	Motivation	Reflective	Beliefs about consequences	Enablers (37.5%)	‘I’ll try to have something that’s not too heavy, but I think it’s important to get something in the tank’
Host Family (n = 2)	Opportunity	Physical	Environmental Constructs	Barriers (50%)	‘I don’t try to eat a lot because then I feel full, and I cannot run’
Restaurant (n = 1)				Barriers (12.5%)	‘I usually eat at home but at that time I didn’t have anything at home’
PRE MATCH					
Stadium (n = 10)	Capability	Psychological	Knowledge	Enablers (20%)	“My mental routine is to try have carbs and protein every time, it can change, sometimes I eat pasta, sometimes I eat rice with chicken. I prefer to have slowly digesting carbs to prevent the peak of my blood glucose’
	Motivation	Automatic	Emotion	Enablers (10%)	I don’t like to eat red meat before the game as I don’t want to get ill. I like rice because it just carbs and it gives me a lot of energy
				Barriers (20%)	‘I don’t want to eat a big meal at 5 pm when the game is late because I will feel heavy afterward’
		Reflective	Beliefs about consequences	Enablers (20%)	‘It makes me feel comfortable and I get the energy I need’
				Barriers (60%)	‘I feel like when it gets closer to the game, I want to have less foods to feel a bit lighter when I play’
DURING MATCH					
Stadium (n = 10)	Capability	Psychological	Knowledge	Enablers (20%)	‘I will have the orange drink; I’ve the espresso for caffeine and hydrators for hydration’
	Opportunity	Social	Social Influences	Enablers (10%)	‘Because the nutritionist says it’s good for me’
	Motivation	Automatic	Emotion	Barriers (40%)	‘I don’t normally have too many carbs during the game, that’s what I have been used to’
		Reflective	Beliefs about consequences	Enablers (10%)	‘Probably for my mind but I think they’re giving me energy also’
				Barriers (40%)	‘I like to feel quite light and it’s something that I have always done so I don’t have a lot during match’
POST MATCH					
Stadium (n = 10)	Capability	Psychological	Knowledge	Enablers (10%)	‘I think after game, it’s important to have protein, it’s an important time to have it’
	Opportunity	Physical	Environmental Constructs	Enablers (10%)	‘It’s more relaxed. I take the stuff from the lounge and then I go home’
		Social	Social Influences	Enablers (10%)	‘I have the protein shake because the nutritionist prepares it for me’
	Motivation	Reflective	Beliefs about consequences	Enablers (10%)	‘For me, I just eat whatever foods I can to get the energy’
		Automatic	Emotion	Enablers (30%)	‘I’m quite hungry after the game after the game as I didn’t eat as much before’
				Barriers (30%)	‘I don’t have appetite especially if I played a full game’
POST MATCH DINNER					
Home (n = 5)	Capability	Psychological	Knowledge	Enablers (16.7%)	‘I try to have larger portion of carbs and with some protein’
Restaurant (n = 1)	Opportunity	Social	Social Influences	Enablers (16.7%)	‘Sometimes I will go to the restaurant to have a good time with my friends or family’
	Motivation	Automatic	Emotion	Enablers (16.7%)	‘I will have the snacks when my chef makes them’
				Barriers (50%)	‘It depends how I feel. If I’m really tired, I struggle to eat’

Table 6. COM-B analysis of MD + 1.

Location	COM-B	COM-B Construct	TDF Construct	Frequency of Barrier or Enabler	Sample Quotations
BREAKFAST					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (60%)	'I'll add more carbs and protein to help with my recovery'
	Motivation	Automatic	Emotion	Enablers (30%)	'Because I like it and I don't feel heavy'
		Reflective	Beliefs about consequences	Enablers (20%) Barriers (30%)	'It gives me energy and it's healthy as well' 'I always just have it and that's what I comfortable with, I feel like it doesn't upset my stomach'
POST TRAINING					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (70%)	'I will add additional supplement with the cherry to boost my recovery'
	Opportunity	Physical	Environmental Constructs	Enablers (10%)	'I have the protein shake because it's there for me'
	Motivation	Automatic	Emotion	Enablers (10%) Barriers (10%)	'I'm drinking it to recover and to go again as I might do a bit of gym before I have lunch. When you come in, you're quite hungry as well' 'It depends on how I feel after the training session; I only have it when I feel weak after training'
LUNCH					
Training Ground (n = 10)	Capability	Psychological	Knowledge	Enablers (60%)	""I'll eat more carbs, protein on MD + 1 to replace what I have lost on MD'
	Motivation	Reflective	Beliefs about consequences	Enablers (30%)	'I enjoyed it and also feel comfortable with the foods, and it doesn't upset my stomach. It got all the nutrients that I need'
		Automatic	Emotion	Enablers (40%)	'I have it because I like it'
AFTERNOON SNACKS					
Home (n = 7)	Capability	Psychological	Knowledge	Enablers (29%)	'I have fruits so I've enough fruits for the day, also Greek Yogurt as well because it's low fat and high protein'
	Motivation	Reflective	Beliefs about consequences	Enablers (57%)	'I think it's a good snack to have between lunch and dinner'
		Automatic	Emotion	Enablers (43%)	I like them and they are good for me
DINNER					
Home (n = 7)	Opportunity	Social	Social influences	Enablers (50%)	'Normally she will decide a week in advance what we will have each day'
Host Family Accommodation (n = 2)	Motivation	Automatic	Emotion	Enablers (60%)	'On the day after the game, I like to enjoy more African foods at dinner'
Restaurant (n = 1)					

breakfast intake. Players commonly restricted food intake to avoid feelings of heaviness during the match:

[Participant 4] "I try to not eat a lot because then I feel full and I cannot run".

[Participant 10] "I prefer to eat a bit less than normal on MD because I want to feel lighter during the game".

This pattern persisted at the pre-match meal, where reflective motivation ('beliefs about consequences') (60%) remained the main barrier. Players again prioritised feelings of lightness:

[Participant 3] "I feel like when it gets closer to the game, I want to have less foods to feel a bit lighter when I play".

[Participant 8] "I will have smaller portion at pre match as I like to feel light when I go out to play".

During the match, reflective motivation ('beliefs about consequences') (40%) continued to act as the dominant

barrier. Participant 8 stated that 'I like to feel quite light and it's something that I have always done so I don't have a lot during match', while Participant 9 added that 'I don't want to upset my stomach and that's nothing worse than feeling heavy when you're playing'.

In the immediate post-match period, automatic motivation ('emotion') (40%) emerged as the main barrier, with participants reporting suppressed appetite immediately post-match:

[Participant 1] "Normally after the game, I can't really eat straight away, I have to wait for a few hours before I can eat".

[Participant 4] "I don't have appetite especially if I played a full game."

Similarly, during the PMRM, automatic motivation ('emotion') (50%) remained the main barrier. For instance, Participant 5 stated that 'It depends how I feel. If I'm really tired, I struggle to eat'.

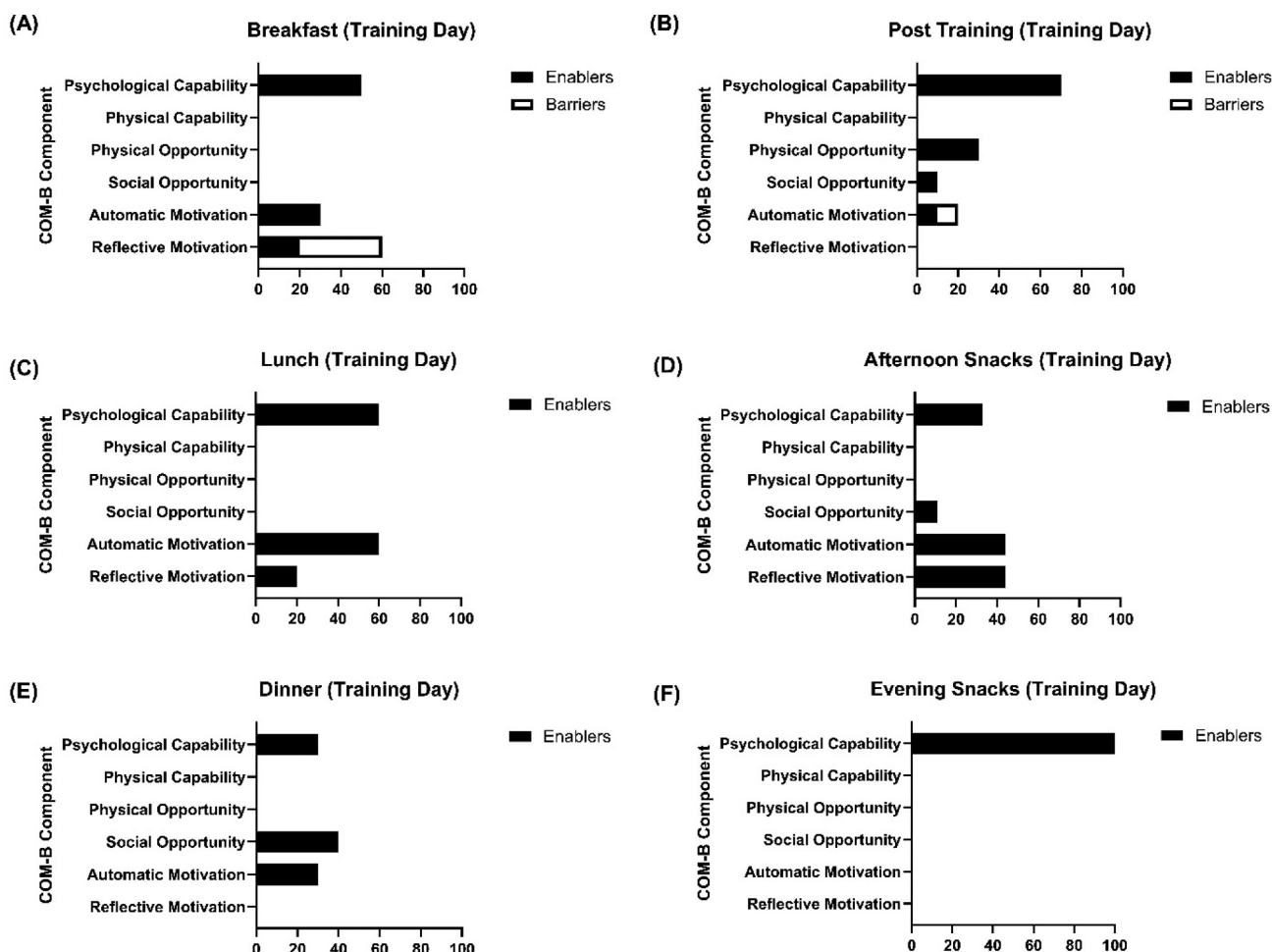


Figure 3. Frequency analysis of each component of COM-B at each mealtime on training days from the perspective of players.

MD +1

On MD + 1, psychological capability ('knowledge') (40%) emerged as the main enabler of dietary practice. Players demonstrated awareness of the need to support recovery though increased intake. For instance, Participant 8 mentioned that 'I'll add more carbs and protein to help with my recovery'. Similarly, psychological capability ('knowledge') (70%) was the main enabler post-training:

[Participant 6] "I will have the cherry drink because it's good for recovery".

[Participant 8] "I will add additional supplement with the cherry to boost my recovery."

At lunch, psychological capability ('knowledge') (60%) again acted as the primary enabler, with players emphasising the need to replenish energy stores. For example, Participant 9 mentioned that 'it's about replenishing what lost, so I will eat as much as I can'. and Participant 10 stated that 'I'll eat more carbs, protein on MD + 1 to replace what I have lost on MD'. For afternoon snacks, reflective motivation ('beliefs about consequences') (57%) was the main

enabler as suggested by Participant 4, 'I like them and they are good for me'. For dinner, social opportunity ('social influences') (50%) was one of the main enablers as described by Participant 7, 'I usually go out to have dinner, just to have some times with the family, that usually will be a restaurant meal'. Additionally, automatic motivation ('emotion') (50%) also functioned as an enabler at dinner, as players expressed a desire to enjoy food on MD + 1:

[Participant 2] "On the day after the game, I will eat whatever I want, just for my mind. But it's not regular. It depends".

[Participant 5] "On the day after the game, I like to enjoy more African foods at dinner".

Discussion

In using a mixed methods approach, we provide the first report to simultaneously evaluate the habitual dietary intakes of male professional soccer players whilst also exploring the potential enablers and barriers that impact

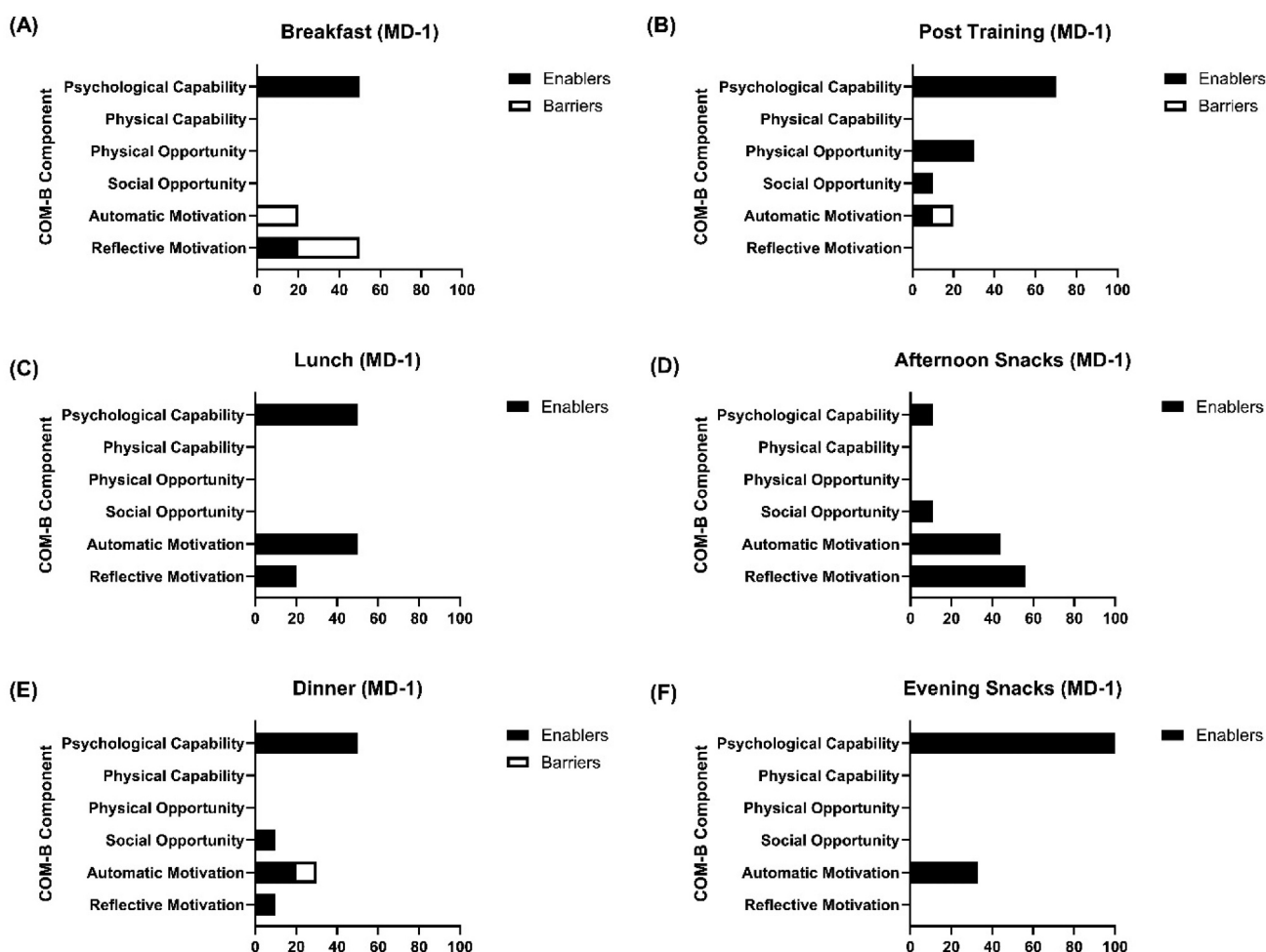


Figure 4. Frequency analysis of each component of COM-B at each mealtime on MD-1 from the perspective of players.

their dietary choices and practices. Importantly, our data demonstrate that the factors affecting players' habitual nutritional practices are different between training days and match days. Indeed, whereas psychological capability (i.e., knowledge of fuelling etc.) was a key enabler to nutritional behaviours on training days, MD-1 and MD + 1, both reflective (i.e., beliefs about consequences) and automatic motivation (i.e., emotions) were the predominant barrier to fuelling and recovery on match days. These preliminary data provide a conceptual framework for sport nutrition practitioners to better understand the factors affecting players' dietary choices on a meal-by-meal and day-by-day basis.

On the training day, mean CHO intake (3.5 ± 0.8 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$) was at the lower end of the recommendations of 3 to 6 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, whereas mean protein intake (2.1 ± 0.1 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$) was aligned with current recommendations of 1.6 to 2.2 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$. These findings were consistent with previous reports in EPL players, which have documented CHO intakes of 3.0 to 4.2 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$) and PRO intakes around 2.2 g·kg

$\text{BM}^{-1} \cdot \text{day}^{-1}$ (Anderson, Orme, et al., 2017; Foo, Hambly, et al., 2025). The relatively low CHO intake reported may be partly explained by a key barrier identified at breakfast ('beliefs about consequences'), whereby players reported avoiding higher CHO intakes to prevent sensations of heaviness before training. Similar barriers have been reported previously, with athletes describing difficulties tolerating the volume of the foods required to meet CHO recommendations and experiencing gastrointestinal discomfort when doing so (Logue et al., 2021). Consequently, practitioners may consider targeted interventions such as dietary manipulation of fermentable oligo-, di-, and mono-saccharides and polyols (FODMAP) as well as gut training or feeding tolerance adjustments to reduce gastrointestinal symptoms and support higher CHO intakes when required (Costa et al., 2025). In contrast, nutrition knowledge emerged as the primary enabler influencing dietary behaviours post training and at lunch. This aligns with earlier research showing that sports nutrition knowledge influences

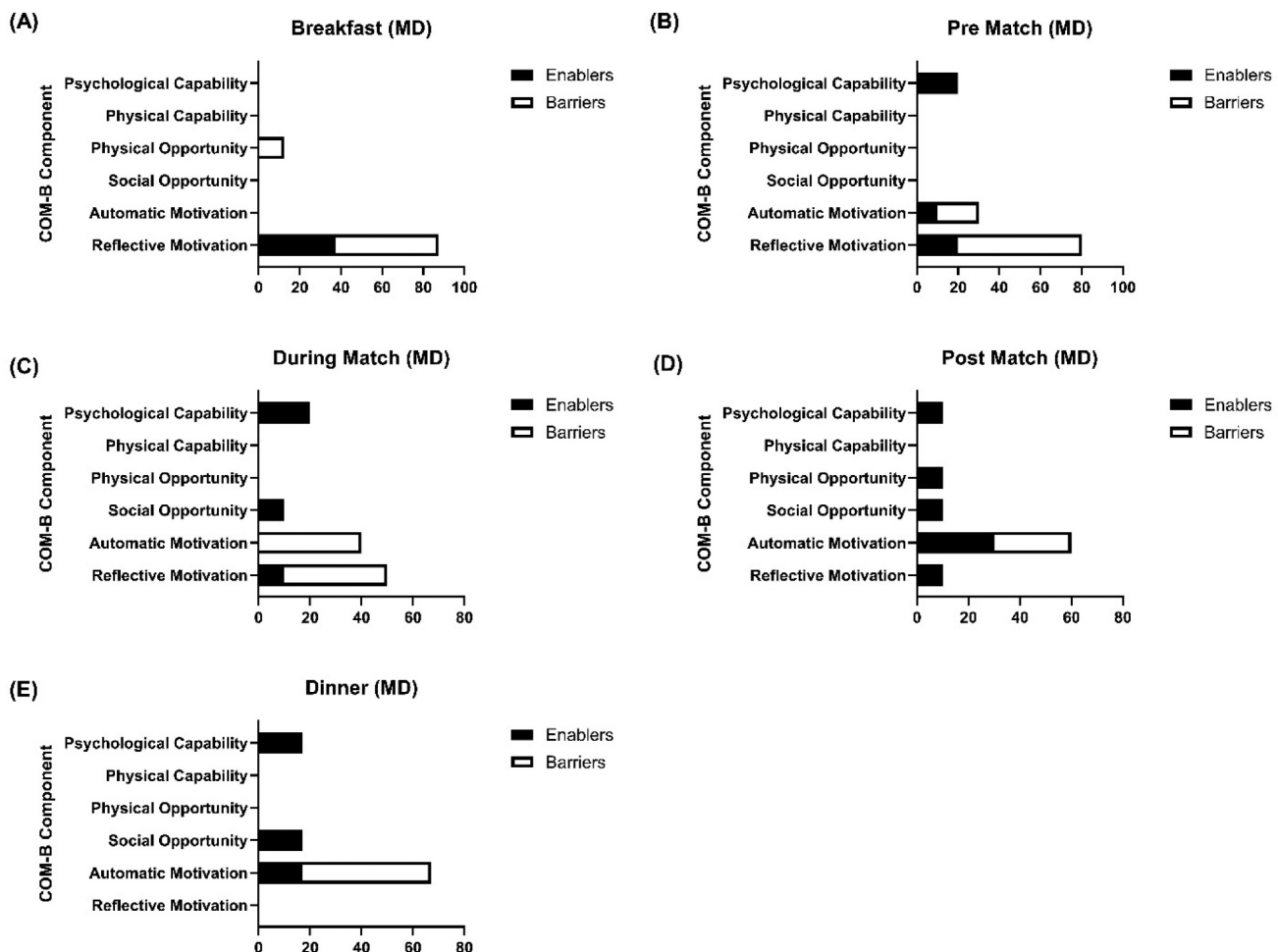


Figure 5. Frequency analysis of each component of COM-B at each mealtime on MD from the perspective of players.

dietary practices among EPL academy players (Carney et al., 2024; Carter, Lee, Ranchordas, et al., 2023). At dinner, 'social influences' were identified as the main enabler, with key external stakeholders such as partners or private chefs exerting a substantial influence on food choices. This coincides with previous literature highlighting the role of interpersonal determinants including family members, peers and support staff in shaping athletes' dietary behaviours (Carter, Lee, Ranchordas, et al., 2023; Jenner et al., 2021; Long et al., 2011; Stokes et al., 2018). Notably, the current findings revealed a contextual discrepancy between enablers influencing players' eating behaviours at the training ground versus those behaviours 'away from the training ground'. Within the club environment, decisions appeared to be primarily guided by knowledge and professional advice, reflecting the players desire to align with the perceived norms within the professional soccer culture (Ono et al., 2012; Foo, Tester, et al., 2025), whereas outside this

setting, social influences were more prominent. These findings highlight the importance of environmental context in shaping dietary behaviours. Practitioners should therefore consider the BCT 'practical social support' through educating and engaging family members, caregivers, partners and personal chefs to foster consistency in nutritional practices.

On MD-1, the players consumed significantly higher CHO intake than training days, MD and MD + 1, mainly due to the greater CHO intakes at lunch (MD-1: 1.3 ± 0.3 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, training day: 1.0 ± 0.4 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, MD + 1: 1.0 ± 0.2 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$), afternoon snacks (MD-1: 0.8 ± 0.4 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, training day: 0.6 ± 0.2 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, MD + 1: 0.6 ± 0.4 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$) and dinner (MD-1: 1.0 ± 0.3 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, training day: 0.9 ± 0.3 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$, MD + 1: 0.8 ± 0.2 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$). Nevertheless, mean relative intake (4.6 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$) remained below the recommended 6 to 8 g·kg $\text{BM}^{-1} \cdot \text{day}^{-1}$ (Collins et al., 2021). This shortfall aligns with previous research

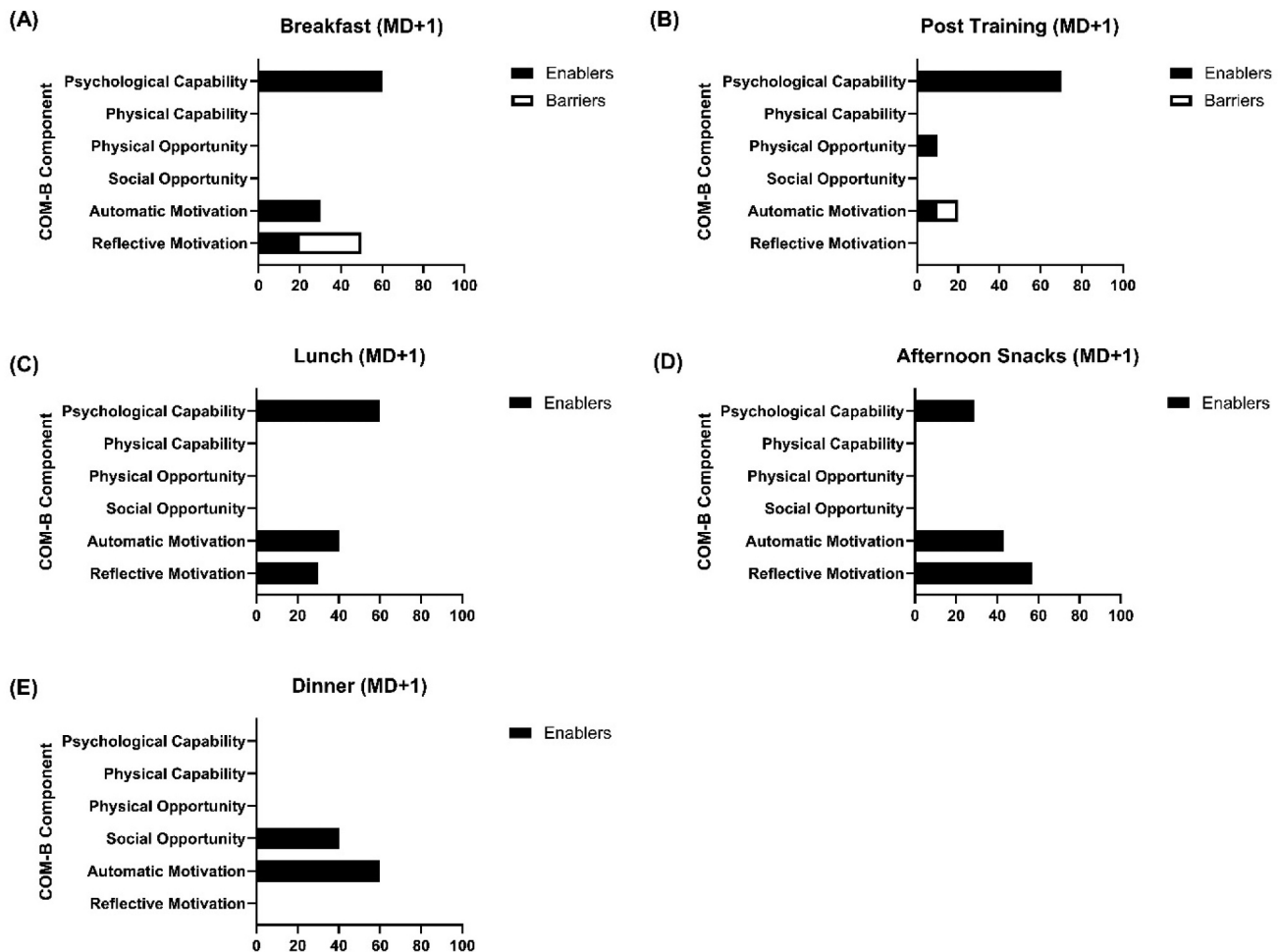


Figure 6. Frequency analysis of each component of COM-B at each mealtime on MD + 1 from the perspective of players.

conducted in male EPL players, where MD-1 CHO intakes ranged from 3.5 to 4.2 g·kg⁻¹·day⁻¹ (Anderson, Orme, et al., 2017; Foo, Hambly, et al., 2025), suggesting that suboptimal fuelling persists despite the well-established guidelines. Qualitative findings indicated that players generally recognised the importance of CHO for match performance on MD-1 and identified this awareness as an enabler of their dietary behaviours. While this translated into significantly higher CHO intake on MD-1, intakes nonetheless remained below recommendations, similar to the previous observations in endurance athletes (Sampson et al., 2024). This disconnect between knowledge and practice highlights the limitations of education-based sports nutrition interventions that rely heavily on ‘information about health consequences’ or ‘instructions on how to perform the behaviour’ (Bentley et al., 2020). Without the opportunities for ‘behavioural rehearsal and practice’, such approaches may fail to convert awareness into consistent dietary action. Evidence supporting the effectiveness of strategies

incorporating ‘persuasion’ such as visible nutritionist presence, structured meal-time prompts and digital nudges, in promoting higher CHO intake (Carter et al., 2024), further highlights the need for BCTs beyond education alone. In addition, ‘restructuring the physical environment’ has been previously shown to increase CHO intakes by enhancing the accessibility and availability of CHO-dense foods (Salagaras et al., 2021). Collectively, these findings suggest that professional soccer players recognise the performance benefits of CHO but often lack the practical strategies to meet recommendations. This contrasts with academy players where limited awareness of nutrition has been highlighted (Carney et al., 2024) and with the prevailing CHO fear documented in women’s soccer environment (McHaffie et al., 2022). From a practical perspective, this highlights the need for interventions that move beyond knowledge provision to focus on behaviour change strategies capable of bridging the gap between awareness and optimal fuelling practices.

On MD, mean CHO intake was below current recommendations across all key phases: pre-match ($0.9 \text{ g}\cdot\text{kg BM}^{-1}$ vs. $1\text{--}4 \text{ g}\cdot\text{kg BM}^{-1}$), during match play ($24 \text{ g}\cdot\text{h}^{-1}$ vs. $30\text{--}60 \text{ g}\cdot\text{h}^{-1}$), and post-match ($0.8 \text{ g}\cdot\text{kg BM}^{-1}$ vs. $1 \text{ g}\cdot\text{kg BM}^{-1}\cdot\text{h}^{-1}$ during the first 4 h), with similarly low intake at PMRM ($0.8 \text{ g}\cdot\text{kg BM}^{-1}$). Pre-match CHO intake was lower than previously reported in EPL players (~ 1.3 to $1.4 \text{ g}\cdot\text{kg BM}^{-1}$) (Anderson, Naughton, et al., 2017), whereas CHO intake during match was higher than a recent report from EPL pre-season matches ($17 \pm 11 \text{ g}\cdot\text{h}^{-1}$) (Kasper et al., 2024). Immediate post-match CHO intakes were comparable to earlier findings of $<1 \text{ g}\cdot\text{kg BM}^{-1}$ (Anderson, Naughton, et al., 2017). Suboptimal CHO intake during the critical recovery period is likely to compromise muscle glycogen resynthesis, particularly within fast twitch muscle fibres (Ermidis et al., 2024) and may reduce intermittent exercise capacity on the subsequent day (Díaz-Lara et al., 2024). Qualitative analysis identified 'beliefs about consequences' as the key barriers to fuelling at pre match and during matches, suggesting that players may deliberately restrict CHO before and during the match to preserve a subjective feeling of lightness. The players' conscious and deliberative consideration of the perceived disadvantages of consuming a large volume of CHO suggests that these mealtime behaviours were more strongly influenced by reflective motivation than by automatic motivation. Reflective motivation involves intentional evaluation and decision-making, whereas automatic motivation is characterised by more impulsive processes that occur without deliberate thought or planning (Michie et al., 2011). This perception aligns with applied practitioners' perspectives and highlights that, although current guidelines are physiologically robust, their practical feasibility may be constrained by food volumes required and associated risk of gastrointestinal discomfort (Costello et al., 2025). In this context, BCTs such as 'behavioural practice and rehearsal' are likely effective in supporting improved fuelling behaviours. Practical strategies include prioritising low-fibre, energy-dense CHO sources (Foo et al., 2022) and incorporating systemic 'gut training' during training and match preparation (Martinez et al., 2023) could help to improve tolerance to higher CHO intakes. Furthermore, a recent study in EPL players reported that only 38% of total fluid intake was derived from low-concentrated CHO beverages (6%) (Kasper et al., 2024). This suggests that a greater proportion of total fluid intake may need to be provided by more concentrated CHO beverages (e.g., 12%) to achieve the recommended CHO intake of 30 to $60 \text{ g}\cdot\text{h}^{-1}$ during match play. Supporting this, previous research demonstrated that ingesting a 12% CHO-electrolyte beverage providing 60 g CHO during

simulated match play induced only minimal gastrointestinal discomfort and bloating (Funnell et al., 2017), indicating that this strategy is both practical and well tolerated. For post-match and PMRM, 'emotion' was cited as the primary barrier, with many players reporting suppressed appetite. Similar reports have been observed in Australian Rules football players (Jenner et al., 2021), consistent with the evidence of reduced subjective hunger and suppressed acylated ghrelin following high-intensity intermittent exercise (Hu, Kong, et al., 2023; Hu, Nie, et al., 2023). The involuntary nature of appetite suppression suggests that these mealtime behaviours are predominantly influenced by automatic motivation rather than reflective motivation, as players' reduced desire to eat appears to arise rapidly from physiological and emotional responses to match-play rather than through conscious evaluation or deliberate decision-making (Michie et al., 2011). To mitigate this, providing convenient, palatable and cultural appropriate options post-match has been recommended (Ranchordas et al., 2017). These findings highlight that optimising MD fuelling and re-fuelling in professional players requires practitioners to move beyond absolute CHO targets and instead implement strategies that balance physiological robustness with contextual feasibility by accounting for player beliefs, comfort and post-match appetite while ensuring sufficient CHO intake to support muscle glycogen resynthesis, recovery and performance.

On MD + 1, mean CHO intake ($3.6 \pm 0.5 \text{ g}\cdot\text{kg BM}^{-1}\cdot\text{day}^{-1}$) was significantly below the recommended intake of 6 to $8 \text{ g}\cdot\text{kg BM}^{-1}\cdot\text{day}^{-1}$ (Collins et al., 2021). Comparable intakes of 3 to $4 \text{ g}\cdot\text{kg BM}^{-1}\cdot\text{day}^{-1}$ were previously reported among EPL first team and academy players on MD + 1 (Anderson, Orme, et al., 2017; Carter, Lee, Perrin, et al., 2023; Foo, Hambly, et al., 2025). Maintaining high CHO availability on the day following the match is critical, particularly during congested periods, as intakes of $9.5 \text{ g}\cdot\text{kg BM}^{-1}\cdot\text{day}^{-1}$ have been shown to fully restore muscle glycogen within 72 h after a 90 min soccer game (Krustrup et al., 2011). Furthermore, additional CHO supplementation on days following the match has been associated with the preservation of repeated sprint ability, running speed, intense acceleration and deceleration while attenuating muscle damage and inflammatory responses before and during the subsequent match (Ermidis et al., 2024). Similar to MD-1, 'knowledge' was identified as a key enabler of dietary practices on MD + 1 at breakfast, post training and lunch. Nevertheless, players still failed to achieve the recommended CHO intake, indicating awareness alone was insufficient to translate guidelines into practice. This suggests a need to enhance players' practical capability to operationalise recovery nutrition

strategies. In this context, incorporating BCTs including 'instructions on how to perform behaviour' and 'demonstration of behaviour' may be effective in illustrating what appropriate fuelling should look like across MD + 1 via educational infographics outlining meal timing, portion sizes, and example food combinations across the day, alongside live or video-based demonstrations of optimal recovery meals and snacks provided within the training-ground environment (Carter et al., 2024; Thompson et al., 2026). In addition, providing recovery snack bags consisting of CHO-rich foods ('enablement') has been shown to effectively CHO intake on MD + 1 (Carter et al., 2024). At dinner, however, 'emotion' and 'social influences' were the dominant enablers, as reflected in players' preferences for culturally familiar foods. These findings align with the evidence from Australian Rules football, where interpersonal factors such as the influence of family and peers and mood were also identified as key determinants of dietary behaviour (Jenner et al., 2021). Accordingly, providing 'practical social support' by educating and engagement of family members and partners may help players maintain social connectedness while still making nutritional appropriate choices. Furthermore, implementing themed dining days focused on different cultural cuisines may help accommodate player preferences, enhance enjoyment and improve adherence to nutritional recommendations (Ranchordas et al., 2017; Haller et al., 2022). The present findings indicate that although players were aware of the importance of CHO and protein for fuelling and recovery on MD + 1, this awareness did not translate to optimal dietary practice, indicating that they lacked the practical knowledge required to meet established guidelines. In addition, recognising and addressing the social and emotional drivers of food choice may be critical to bridging the gap between recommendations and dietary behaviours on MD + 1, thereby ensuring nutritional strategies are both evidence-based and contextually effective.

This study has several limitations. Firstly, this study was conducted on ten players from a single EPL soccer team, which may limit the generalizability of findings to other teams and leagues. For example, the enablers and barriers identified in this study may differ in players from teams with varying levels of access to nutritional support and resources. Nevertheless, the insufficient CHO intakes observed in this study are consistent with previous literature (Steffl et al., 2019). Additionally, this study may benefit with a larger sample size due to a potential issue with the statistical power. Furthermore, dietary intakes measured via RFPM are subjected to under-reporting and bias, missed snacks, behavioural changes resulting from being monitored, variable compliance with the RFPM protocol and

inaccuracies in researcher-estimated portion sizes as shown in previous literature in athletic population (Capling et al., 2017; Stables et al., 2021). Nonetheless, our assessments were strengthened by prior training on data collection and the onsite presence of the researcher at the training ground to assist participants where required. Even when accounting for the estimated underreporting (18%) in this population (Foo, Hambly, et al., 2025) and assuming all unreported energy was derived from CHO, mean CHO would increase by $\sim 1.8 \text{ g}\cdot\text{kg BM}^{-1}$; however, players would still not achieve recommended CHO intakes, particularly on MD and MD + 1. Furthermore, assessing dietary intake on a single training day (MD-2) is unlikely to capture the day-to-day variability in nutritional intake associated with fluctuations in training load. However, extending the duration of dietary assessment may adversely affect participant compliance (Capling et al., 2017). Therefore, further research is warranted to investigate whether the enablers and barriers influencing dietary intake differ across training days and microcycles with varying demands. Moreover, the absence of external load quantification was acknowledged as a limitation of the present study and future research should incorporate measures of external load to facilitate a more comprehensive interpretation of dietary intake. Finally, the interview was conducted by the lead researcher, who was also the performance nutritionist at the club and this may bias the interviewer's approach and the response from the participants. However, interviewer's fluency in understanding the players' jargon and informal language and the ability to develop rapport with the participants were considered advantageous.

In summary, we report for the first time the assessment of enablers and barriers influencing dietary behaviours of professional soccer players across training days, MD-1, MD and MD + 1 using the COM-B model. Despite nutrition knowledge serving as the key enablers for the majority of meals, CHO intakes were consistently below recommendations on MD-1 and MD + 1, indicating that awareness of importance of nutrition alone is insufficient to ensure optimal dietary practices. Pre-match and during match CHO consumption was also suboptimal, largely driven by players' desire to maintain a subjective sense of lightness, while post-match and PMRM CHO intakes were limited by suppressed appetite. These findings highlight the multifaceted nature of dietary behaviours in elite soccer and suggest that effective nutrition interventions should combine education with practical strategies and behaviour change techniques. Future research should apply this research framework across different sports and populations to identify context-specific barriers and enablers and inform personalised nutritional interventions.

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Author contributions

CRedit: **Wee Lun Foo:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Writing – original draft, Writing – review & editing; **Graeme L. Close:** Writing – review & editing; **José L. Areta:** Supervision, Writing – review & editing; **James P. Morton:** Conceptualization, Methodology, Supervision, Writing – original draft, Writing – review & editing.

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Compliance with ethical standards

Verbal and written consent was obtained from all participants prior to the commencement of the investigation. Ethical approval was obtained from Liverpool John Moores University Ethics Committee (REC approval number: 24/SPS/049) prior to the initiation of this study.

Data availability statement

The data that support the findings of this study are available from the authors upon reasonable request.

References

- Anderson, L., Naughton, R. J., Close, G. L., DiMichele, R., Morgans, R., Drust, B., & Morton, J. P. (2017). Daily distribution of macronutrient intakes of professional soccer players from the English Premier League. *International Journal of Sport Nutrition and Exercise Metabolism*, 27(6), 491–498. <https://doi.org/10.1123/ijsnem.2016-0265>
- Anderson, L., Orme, P., Naughton, R. J., Close, G. L., Milsom, J., Rydings, D., O'Boyle, A., DiMichele, R., Louis, J., Hambly, C., Speakman, J. R., Morgans, R., Drust, B., & Morton, J. P. (2017). Energy intake and expenditure of professional soccer players of the English Premier League: Evidence of carbohydrate periodization. *International Journal of Sport Nutrition and Exercise Metabolism*, 27(3), 228–238. <https://doi.org/10.1123/ijsnem.2016-0259>
- Austin, Z., & Sutton, J. (2014). Qualitative research: Getting started. *The Canadian Journal of Hospital Pharmacy*, 67(6), 436–440. <https://doi.org/10.4212/cjhp.v67i6.1406>
- Bentley, M. R. N., Mitchell, N., & Backhouse, S. H. (2020). Sports nutrition interventions: A systematic review of behavioural strategies used to promote dietary behaviour change in athletes. *Appetite*, 150, 104645. <https://doi.org/10.1016/j.appet.2020.104645>
- Burke, L. M., Van Loon, L. J. C., & Hawley, J. A. (2017). Postexercise muscle glycogen resynthesis in humans. *Journal of Applied Physiology*, 122(5), 1055–1067. <https://doi.org/10.1152/jappphysiol.00860.2016>
- Cane, J., O'Connor, D., & Michie, S. (2012). Validation of the theoretical domains framework for use in behaviour change and implementation research. *Implementation Science*, 7(1), 37. <https://doi.org/10.1186/1748-5908-7-37>
- Capling, L., Beck, K. L., Gifford, J. A., Slater, G., Flood, V. M., & O'Connor, H. (2017). Validity of dietary assessment in athletes: A systematic review. *Nutrients*, 9(12), 1313. <https://doi.org/10.3390/nu9121313>
- Carney, D. J., Hannon, M. P., Murphy, R. C., Close, G. L., & Morton, J. P. (2024). Perspectives on the role of nutrition in influencing academy soccer player development and performance: A qualitative case study of key stakeholders from an English category one soccer academy. *Journal of Sports Sciences*, 42(1), 61–72. <https://doi.org/10.1080/02640414.2024.2321008>
- Carter, J. L., Lee, D. J., Fenner, J. S. J., Ranchordas, M. K., & Cole, M. (2024). Contemporary educational and behavior change strategies improve dietary practices around a match in professional soccer players. *Journal of the International Society of Sports Nutrition*, 21(1), 2391369. <https://doi.org/10.1080/15502783.2024.2391369>
- Carter, J. L., Lee, D. J., Perrin, C. G., Ranchordas, M. K., & Cole, M. (2023). Significant changes in resting metabolic rate over a competitive match week are accompanied by an absence of nutritional periodization in male professional soccer players. *International Journal of Sport Nutrition and Exercise Metabolism*, 33(6), 349–359. <https://doi.org/10.1123/ijsnem.2023-0069>
- Carter, J. L., Lee, D. J., Ranchordas, M. K., & Cole, M. (2023). Perspectives of the barriers and enablers to nutritional adherence in professional male academy football players. *Science and Medicine in Football*, 7(4), 394–405. <https://doi.org/10.1080/24733938.2022.2123554>
- Collins, J., Maughan, R. J., Gleeson, M., Bilsborough, J., Jeukendrup, A., Morton, J. P., Phillips, S. M., Armstrong, L., Burke, L. M., Close, G. L., Duffield, R., Larson-Meyer, E., Louis, J., Medina, D., Meyer, F., Rollo, I., Sundgot-Borgen, J., Wall, B. T., Boullousa, B., ... McCall, A. (2021). UEFA expert group statement on nutrition in elite football. Current evidence to inform practical recommendations and guide future research. *British Journal of Sports Medicine*, 55(8), 416. <https://doi.org/10.1136/bjsports-2019-101961>

- Costello, N., Roe, S., Backhouse, S. H., & Bentley, M. R. N. (2025). Barriers and enablers to implementing the UEFA consensus statement on nutrition: Insights from sport nutrition practitioners in the English Premier League. *Science and Medicine in Football*, 10(2), 1–14. <https://doi.org/10.1080/24733938.2025.2517055>
- Cowan, D., & Taylor, I. M. (2016). 'I'm proud of what I achieved; I'm also ashamed of what I done': A soccer coach's tale of sport, status, and criminal behaviour. *Qualitative Research in Sport, Exercise & Health*, 8(5), 505–518. <https://doi.org/10.1080/2159676X.2016.1206608>
- Danielik, K., Książek, A., Zagrodna, A., & Słowińska-Lisowska, M. (2022). How do male football players meet dietary recommendations? A systematic literature review. *International Journal of Environmental Research and Public Health*, 19(15), 9561. <https://doi.org/10.3390/ijerph19159561>
- Díaz-Lara, J., Reisman, E., Botella, J., Probert, B., Burke, L. M., Bishop, D. J., & Lee, M. J. (2024). Delaying post-exercise carbohydrate intake impairs next-day exercise capacity but not muscle glycogen or molecular responses. *Acta Physiologica*, 240(10), e14215. <https://doi.org/10.1111/apha.14215>
- Ermidis, G., Mohr, M., Jamurtas, A. Z., Draganidis, D., Poulos, A., Papanikolaou, K., Vigh-Larsen, J. F., Loules, G., Sovatzidis, A., Nakopoulou, T., Tsimeas, P., Douroudos, I. I., Papadopoulos, C., Papadimas, G., Rosvoglou, A., Liakou, C., Deli, C. K., Georgakouli, K., Chatzinikolaou, A., ... Fatouros, I. G. (2024). Recovery during successive 120-min football games: Results from the 120-min Placebo/carbohydrate randomized controlled trial. *Medicine & Science in Sports and Exercise*, 56(6), 1094–1107. <https://doi.org/10.1249/MSS.0000000000003398>
- Fernandes, R. K., Barreto, A. C., Santos, R. G., Santos, R. S., Gomes, L. P., Nascimento, M. V., Noronha, D. C., Santos, M. I., Santos, A. A., & Corrente, L. G. (2020). Nutrition knowledge is correlated with a better dietary intake in adolescent soccer players: A Cross-Sectional study. *Journal of Nutrition and Metabolism*, 2020(1), 3519781, p..
- Foo, W. L., Hambly, C., Tester, E., Markakis, P., Areta, J. L., Close, G. L., Speakman, J. R., & Morton, J. P. (2025). Energy expenditure of male soccer players from an English Premier League team does not differ between one-game and two-game per week microcycles. *Medicine & Science in Sports and Exercise*. [online] Available at.
- Foo, W. L., Harrison, J. D., Mhizha, F. T., Langan-Evans, C., Morton, J. P., Pugh, J. N., & Areta, J. L. (2022). A short-term low-fiber diet reduces body Mass in healthy young men: Implications for weight-sensitive Sports. *International Journal of Sport Nutrition and Exercise Metabolism*, 32(4), 256–264. <https://doi.org/10.1123/ijsnem.2021-0324>
- Foo, W. L., Tester, E., Close, G. L., Cronin, C. J., & Morton, J. P. (2025). Professional male soccer players' perspectives of the nutrition culture within an English Premier League football club: A qualitative exploration using Bourdieu's concepts of habitus, capital and field. *Sports Medicine (Auckland, N.Z.)*, 55(4), 1009–1022. <https://doi.org/10.1007/s40279-024-02134-w>
- Foskett, A., Williams, C., Boobis, L., & Tsintzas, K. (2008). Carbohydrate availability and muscle energy Metabolism during intermittent running. *Medicine & Science in Sports and Exercise*, 40(1), 96–103. <https://doi.org/10.1249/mss.0b013e3181586b2c>
- Funnell, M. P., Dykes, N. R., Owen, E. J., Mears, S. A., Rollo, I., & James, L. J. (2017). Ecologically valid carbohydrate intake during soccer-specific exercise does not affect running performance in a fed state. *Nutrients*, 9(1), 39. <https://doi.org/10.3390/nu9010039>
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction* (8th ed, Pearson internat ed.). Pearson.
- Gunnarsson, T. P., Bendiksen, M., Bischoff, R., Christensen, P. M., Lesivig, B., Madsen, K., Stephens, F., Greenhaff, P., Krstrup, P., & Bangsbo, J. (2013). Effect of whey protein- and carbohydrate-enriched diet on glycogen resynthesis during the first 48 h after a soccer game. *Scandinavian Journal of Medicine and Science in Sports*, 23(4), 508–515. <https://doi.org/10.1111/j.1600-0838.2011.01418.x>
- Harper, L. D., Stevenson, E. J., Rollo, I., & Russell, M. (2017). The influence of a 12% carbohydrate-electrolyte beverage on self-paced soccer-specific exercise performance. *Journal of Science & Medicine in Sport*, 20(12), 1123–1129. <https://doi.org/10.1016/j.jsams.2017.04.015>
- Hopkins, W. G., Marshall, S. W., Batterham, A. M., & Hanin, J. (2009). Progressive statistics for studies in sports medicine and exercise science. *Medicine & Science in Sports and Exercise*, 41(1), 3–12. <https://doi.org/10.1249/MSS.0b013e31818cb278>
- Hu, M., Kong, Z., Shi, Q., & Nie, J. (2023). Acute effect of high-intensity interval training versus moderate-intensity continuous training on appetite-regulating gut hormones in healthy adults: A systematic review and meta-analysis. *Heliyon*, 9(2), e13129. <https://doi.org/10.1016/j.heliyon.2023.e13129>
- Hu, M., Nie, J., Lei, O. K., Shi, Q., & Kong, Z. (2023). Acute effect of high-intensity interval training versus moderate-intensity continuous training on appetite perception: A systematic review and meta-analysis. *Appetite*, 182, 106427. <https://doi.org/10.1016/j.appet.2022.106427>
- Jenner, S., Belski, R., Devlin, B., Coutts, A., Kempton, T., & Forsyth, A. (2021). A qualitative investigation of factors influencing the dietary intakes of professional Australian football players. *International Journal of Environmental Research and Public Health*, 18(8), 4205. <https://doi.org/10.3390/ijerph18084205>
- Kasper, A. M., Allan, J., Hodges, D., Catterson, P., Mason, L., Fitzpatrick, J., Grantham, N., Morton, J. P., Hearn, M. A., & Close, G. L. (2024). Nutritional habits of professional team sport athletes: An insight into the carbohydrate, fluid, and caffeine habits of English Premier League football players during match play. *Journal of Sports Sciences*, 42(17), 1589–1596. <https://doi.org/10.1080/02640414.2024.2402137>
- Krstrup, P., Ortenblad, N., Nielsen, J., Nybo, L., Gunnarsson, T. P., Iaia, F. M., Madsen, K., Stephens, F., Greenhaff, P., & Bangsbo, J. (2011). Maximal voluntary contraction force, SR function and glycogen resynthesis during the first 72 h after a high-level competitive soccer game. *European Journal of Applied Physiology*, 111(12), 2987–2995. <https://doi.org/10.1007/s00421-011-1919-y>
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage Publications.
- Logue, D. M., Mahony, L., Corish, C. A., Tobin, D., Doherty, R., O'Higgins, G., & Madigan, S. M. (2021). Athletes' and coaches' perceptions of nutritional advice: Eating more food for health and performance. *Nutrients*, 13(6), 1925.

- Long, D., Perry, C., Unruh, S. A., Lewis, N., & Stanek-Krogstrand, K. (2011). Personal food systems of male collegiate football players: A grounded theory investigation. *Journal of Athletic Training*, 46(6), 688–695. <https://doi.org/10.4085/1062-6050-46.6.688>
- Martin, C. K., Han, H., Coulon, S. M., Allen, H. R., Champagne, C. M., & Anton, S. D. (2009). A novel method to remotely measure food intake of free-living individuals in real time: The remote food photography method. *The British Journal of Nutrition*, 101(3), 446–456. <https://doi.org/10.1017/S0007114508027438>
- Martinez, I. G., Mika, A. S., Biesiekierski, J. R., & Costa, R. J. S. (2023). The effect of gut-training and feeding-challenge on markers of gastrointestinal status in response to endurance Exercise: A systematic literature review. *Sports Medicine*, 53(6), 1175–1200. <https://doi.org/10.1007/s40279-023-01841-0>
- McHaffie, S. J., Langan-Evans, C., Morehen, J. C., Strauss, J. A., Areta, J. L., Rosimus, C., Evans, M., Elliott-Sale, K. J., Cronin, C. J., & Morton, J. P. (2022). Carbohydrate fear, skin-fold targets and body image issues: A qualitative analysis of player and stakeholder perceptions of the nutrition culture within elite female soccer. *Science and Medicine in Football*, 6(5), 675–685. <https://doi.org/10.1080/24733938.2022.2101143>
- Michie, S., van Stralen, M. M., & West, R. (2011). The behaviour change wheel: A new method for characterising and designing behaviour change interventions. *Implementation Science: IS*, 6(1), 42. <https://doi.org/10.1186/1748-5908-6-42>
- Morehen, J. C., Rosimus, C., Cavanagh, B. P., Hambly, C., Speakman, J. R., Elliott-Sale, K. J., Hannon, M. P., & Morton, J. P. (2022). Energy expenditure of female International standard soccer players: A doubly labeled water investigation. *Medicine & Science in Sports and Exercise*, 54(5), 769–779. <https://doi.org/10.1249/MSS.0000000000002850>
- Noronha, D. C., Santos, M. I., Santos, A. A., Corrente, L. G., Fernandes, R. K., Barreto, A. C., Santos, R. G., Santos, R. S., Gomes, L. P., & Nascimento, M. V. (2020). Nutrition knowledge is correlated with a better dietary intake in adolescent soccer players: A Cross-Sectional study. *Journal of Nutrition and Metabolism*, 2020(1), 3519781.
- Ono, M., Kennedy, E., Reeves, S., & Cronin, L. (2012). Nutrition and culture in professional football. A mixed method approach. *Appetite*, 58(1), 98–104. <https://doi.org/10.1016/j.appet.2011.10.007>
- Pelly, F. E., Thurecht, R. L., & Slater, G. (2022). Determinants of food choice in athletes: A systematic scoping review. *Sports Medicine - Open*, 8(1), 77. <https://doi.org/10.1186/s40798-022-00461-8>
- Ranchordas, M. K., Dawson, J. T., & Russell, M. (2017). Practical nutritional recovery strategies for elite soccer players when limited time separates repeated matches. *Journal of the International Society of Sports Nutrition*, 14(1), 35. <https://doi.org/10.1186/s12970-017-0193-8>
- Rodriguez-Giustiniani, P., Rollo, I., Witard, O. C., & Galloway, S. D. R. (2019). Ingesting a 12% carbohydrate-electrolyte beverage before each half of a soccer match simulation facilitates retention of passing performance and improves high-intensity running capacity in academy players. *International Journal of Sport Nutrition and Exercise Metabolism*, 29(4), 397–405. <https://doi.org/10.1123/ijsnem.2018-0214>
- Salazaras, B. S., Mackenzie-Shalders, K. L., Slater, G. J., McLellan, C., & Coffey, V. G. (2021). Increased carbohydrate availability effects energy and nutrient periodisation of professional male athletes from the Australian football league. *Applied Physiology, Nutrition, and Metabolism*, 46(12), 1510–1516.
- Sampson, G., Morton, J. P., & Areta, J. L. (2024). A broken link: Knowledge of carbohydrate requirements do not predict carbohydrate intake around competition in endurance athletes. *European Journal of Sport Science*, 24(10), 1395–1404. <https://doi.org/10.1002/ejsc.12183>
- Smith, B. (2018). Generalizability in qualitative research: Misunderstandings, opportunities and recommendations for the sport and exercise sciences. *Qualitative Research in Sport, Exercise & Health*, 10(1), 137–149. <https://doi.org/10.1080/2159676X.2017.1393221>
- Stables, R. G., Kasper, A. M., Sparks, S. A., Morton, J. P., & Close, G. L. (2021). An assessment of the validity of the remote food photography method (termed snap-N-Send) in experienced and inexperienced Sport nutritionists. *International Journal of Sport Nutrition and Exercise Metabolism*, 31(2), 125–134. <https://doi.org/10.1123/ijsnem.2020-0216>
- Steffl, M., Kinkorova, I., Kokstejn, J., & Petr, M. (2019). Macronutrient intake in soccer players-A meta-analysis. *Nutrients*, 11(6), 1305. <https://doi.org/10.3390/nu11061305>
- Stokes, E. G., Hughes, R., Shaw, D. M., O'Connor, H. T., & Beck, K. L. (2018). Perceptions and determinants of eating for Health and performance in high-level male adolescent rugby union players. *Sports*, 6(2), 49. <https://doi.org/10.3390/sports6020049>
- Thompson, S., Arthur, R., Naughton, R. J., Morgan, O., Nayler, J., Buchanan, J., & Unnithan, V. B. (2026). A nutritional intervention within highly trained youth soccer players using a COM-B model of behaviour change: A case series approach. *International Journal of Sports Science and Coaching*.