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Research Article

Sports Nutrition in Soccer: a short overview of dietary considerations for players

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Abstract

Recent evidence indicates that coaches in Iran closely monitor diet plans. It is recommended that a nutritionist maintain a long-term relationship with each athletics institute. This gap in nutrition knowledge and modifiable nutrition behaviors can be closed by establishing a nutrition teaching and evaluation tool for coaches and young athletes. An overview of soccer nutrition covers the nature of the sport, training, and how nutrition may enhance player performance and recovery. Soccer competitions require players to engage in acyclical and intermittent activity patterns spanning up to 13 kilometers. The limited muscle glycogen reserves are a crucial component of the interface between training, performance, and nutritional support. Diets rich in carbohydrates may optimize muscle glycogen, minimize net glycogen depletion, postpone tiredness onset, and improve soccer performance. However, it is more frequent for the players to take an excessive quantity of protein daily, promoting the myth that extra protein improves strength and performance. More extensive suggestions include that soccer players should take a high CHO diet consisting of nutrient-dense, complex CHO food sources. Thus, despite the precise physiological demands of soccer and the relationship between nutritional preparation and performance, soccer players' dietary habits are frequently marked by a need for more education and misguided traditions. As soccer players and coaches in Iran become more aware of the importance of sustaining optimal macronutrient nutrition, this article discusses potential barriers and various nutrition phases to consider during training, on the day of the competition, and after the competition.

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Soccer, or football, is one of the most popular sports in the world (1). Many tournament events are comparable to the Olympic Games, and the FIFA World Cup is one of them. Last year, many people were interested in watching the FIFA World Cup 2022, which was held in Qatar, located in Asia (2). At the beginning of the 21st century, Asian societies emphasized football more. In Iran, football matches are played at various levels, and coaches and technical personnel of the football clubs employ multiple tactics to obtain the best results (3). In addition to team tactics, sports science must be applied to achieve the desired outcome, and one area of interest for football players is appropriate nutrition (4-6).

This article will cover nutrition in soocer in light of the significance of this high-level sport among people. Arsène Wenger, FIFA's head of global football development, is a former French coach and player who served a football club for the longest time and had marvelous success. His contributions to English football, which included modifications to scouting, player training, and nutrition regimens, revitalized Arsenal Football Club and promoted the sport's globalization in the twenty-first century. He recently mentioned the importance of sports science, including nutrition, in football. Over the years, the number of clubs with scientific and medical teams has grown. These multidisciplinary teams are now responsible for player care and performance. Nutrition must be part of the performance team's activity and medical meetings when each player's priorities are discussed. It is detrimental to the team when nutrition, like any other part of sports science, exists in isolation, addressing just the questions or serving the interests of a single practitioner (i.e., the nutritionist).

A football game's acyclical and intermittent activity profile, which may cover up to 13 kilometers, puts some physiological systems to the test (6).

The overwhelming bulk of activity happens at a low to moderate level throughout a 90-minute competition Among elite football players, this is often described as movement below 15 km/h. In this case, glycogenolysis and glucose oxidation may be the primary energy pathways. The aerobic system is under extreme stress, with average and peak heart rates of 85 and 98% of maximum values, respectively, equating to the average oxygen consumption of about 70% of maximal levels. Elite football players perform 150-250 high-intensity bouts lasting up to 4 seconds, which may occur every 40-70 seconds although 98 percent of these bouts last less than 10 seconds (7). The distance-to-time ratio of low-to-high intensity exercise was either 2.5:1 or 7:1. The low, moderate, and high intensities of exercise are defined as movement at speeds of 4–12, 15–17, and > 18 km/h, respectively (8). Despite covering a relatively small fraction of the overall distance, high-intensity efforts—characterized by high running speeds (> 18 km/h) or all-out sprinting (30 km/h)—are an essential part of top football performance since the most critical plays in a game typically fall into this category. High-intensity actions such as tackling, jumping, running, and ball possession demand anaerobic systems. Consequently, the intensity profile of a match has implications for energy consumption and the dietary choices required to satisfy these energy requirements. In comparison to the effects of genetic endowment, skill, training, and motivation, nutrition plays a minor but critical part in success. However, a well-planned nutritional strategy that satisfies overall energy expenditure demands should maximize energy reserves, reduce fatigue, support training, achieve and maintain the correct body mass and physical condition, encourage quick recovery, and offer enough hydration. This may provide

The Physiology of Soccer

Soccer is a team sport played intermittently, and professional football players spend more than 70% of the game doing low-intensity movements (e.g., walking, jogging, standing), interspersed with around 150-250 strenuous actions that include maximum sprinting, turning, tackling, kicking, and leaping, as well as accelerations and decelerations (11). Throughout a football match, sudden fatigue may occur during short, intensive activity periods during both halves. This fatigue may worsen as the game draws closer to its end in each half. The study of matches also reveals that the distance covered by top players in high-intensity running during the final 15 minutes of a match is 14–45% lower than the distance recorded during the first 15 minutes (11). However, the distance covered at high intensities might stay consistent during the second half owing to pacing tactics in which players do fewer actions at low or moderate intensities to save energy. Finally, after a match, the performance of leaping, sprinting, and intermittent exercise seems considerably worse than baseline values. The results combined imply that players at the highest level of competition get momentarily worn out after hard bursts and near the game's conclusion. Regarding positional distinctions, center midfielders and wide midfielders (roughly 12 to 13 km) have consistently completed the total distance during professional football competitions (11). In contrast, central defenders have consistently completed the least total distance. Central defenders cover the smallest distance while high intensity and combine high-intensity running with sprinting (11). Wide midfielders and attackers are the football players who cover the most ground in a sprint during competition. Central defenders typically have more time than wide defenders to recover from high-intensity activities. High-intensity performances are a small percentage of a match, but the coach and players should not ignore such activities because they can significantly influence performance (12).

It is of the utmost importance to supply adequate energy for elite football players to meet the challenges of high-intensity, intermittent activities. Several studies have used double-labeled water, heart rate, video match analysis, and activity record monitoring to estimate and measure how much energy football players use. Average match energy expenditure (above rest) is 1107 kcal, whereas regular training is 3442 to 3824 kcal (11). Top football players burned 3,566 kcal throughout a week of five training days and two matches. Besides body size and composition, training load, player position, climatic variables, and tactics affect energy consumption. Football players must balance their calorie intake to meet their specific body composition objectives, training and competition requirements, and essential nutritional targets (11).

Soccer Player Body Composition

Football players often benefit from a lighter and slimmer body since they cover considerable distances during matches and in training. Age, sex, heredity, diet, and the demands of the activity influence the individual's body composition in a football competition. A lean physique with a larger muscle-to-fat ratio is often helpful in sports involving speed since the storage component of body fat may operate as a dead weight that must be raised against gravity when leaping and running. This affects the amount of energy used and oxygen consumed, which negatively correlates with aerobic capacity, power-to-weight ratio, and thermoregulation (13). In football players, six skinfolds linked with adipose mass index were significantly associated with speed decreases on a sprint ability test. At the beginning of the season, higher sprint performance and jump height were associated with lower levels of body fat.

A positive correlation exists between body fat and sprint ability test mean and 20-meter timings. As a result, having a lower percentage of body fat is associated with improved sprint performance (13, 14).In football players from the English Premier League, figures of 10.6%, 11.2 percent, and 10.0 percent were recorded for body fat, ranging from 6 to 20% (7, 11, 15). Positional differences were found, the most notable difference being that goalkeepers had higher body fat values than field players. Regardless of playing position, football players see variations in their fat mass, fat-free soft tissue mass, and mineral mass over the season. Seasonal patterns demonstrate a rise in body fat during the off-season, followed by a decrease during the pre-season when training volume is at its peak (15). In particular, fat mass is reduced between pre-season and the competitive season's beginning. It had, however, reverted to pre-season levels by the end of the competitive season . During pre-season, the fat-free mass significantly increased and maintained its growth throughout the season. To help their football players, coaches may want to create personalized target zones. These goals should be regularly adjusted based on the players' abilities, health, and feedback on their happiness (16).

Macronutrient requirements

Carbohydrates, proteins, and lipids supply the required energy to sustain physiological functioning at rest and throughout football competitions. Below, their functions and necessary quantities in the body are briefly explained (17).

Carbohydrate

Carbohydrates (CHO) are essential for both football training and performance. For sustained, high-intensity exercise is vital, but the amount of time these carbs can be stored is limited, and they may quickly run out. The fundamental role of CHO for football players is to supply energy to the body's cells, especially the brain, promote fat metabolism, and preserve muscular protein (7, 18).

Moreover, it generates enzymes that are necessary for multiple chemical reactions. It is also a constituent of several hormones, such as peptide hormones, fibrous, contractile, and transport proteins. Finally, PROs are the fuel source when muscle glycogen levels are low, for example, during a prolonged football competition.

Lipid

Football players do not primarily use fat for energy, but it is essential for recovery from high-intensity activity and low-intensity aerobic exercises. Fat or lipid is an excellent fuel since it holds roughly twice as much energy as glucose and weighs less. Phospholipids are a form of fat that contributes to the composition of cell membranes (6). Fats are essential for transmitting nerve impulses that cause muscle contraction and function as carriers for specific vitamins. Lipids offer to layer for the protection of crucial organs and insulation against the thermal stress of cold settings, and fats assist in postponing the start of hunger pains since fat empties the stomach more slowly (7, 18). During simulated football play, fat oxidation rates increased from 0.25 to 0.35 g/min across a 90-minute treadmill protocol, and the rate of fat oxidation was inversely linked to CHO consumption during activity (8, 15).In the past, experts advised football players to consume less than 30% of their TDEI from fat, with 7% coming from saturated fat, 10% from polyunsaturated fats, and 13% from monounsaturated fats (6). A diet high in omega-3 fatty acids may also help to lessen delayed onset muscle pain and post-exercise inflammation. Even the leanest football players will have enough fat as an energy substrate during a game. Therefore, players should concentrate on PRO and CHO daily objectives.

Micronutrient requirements

Besides macronutrients, a football player's diet should also include small amounts of micronutrients, minerals, and vitamins (5, 9, 12). It is recommended that football players consume meals that are rich in nutrients for optimal health. Football may result in biochemical changes that increase the requirement for specific micronutrients (14).

In some instances, football players' following a negative energy balance may be suboptimal, and supplementation may be advantageous. However, like other nutrients, the meal should be prioritized before football players' supplements. Iron, vitamin D, and antioxidants need extra attention in football. Usually, professional football players who consume a balanced diet to satisfy their increased energy needs consume adequate quantities of B vitamins (17). However, evidence suggests that iron deficiencies are more prevalent among players during the in-season. Iron deficiency without anemia should be treated by increasing the consumption of well-absorbed iron foods. When iron deficiency anemia is identified, clinical monitoring is required. Iron deficiency/depletion was observed in almost 31% of professional football players. However, the iron status did not change throughout the season of competition (17).

Hydration and Electrolytes

This section of the article is essential for football players and the technical personnel of the team due to Iran's location and climate. Football players commonly experience dehydration, even in freezing conditions, due to the significant amount of fluid lost through sweat. There are limited opportunities for fluid intake during a football match, and the ability to empty fluid from the stomach may be compromised. Dehydration of 1% or 2% impairs football-specific performance, especially intermittent high-intensity sprinting, and dribbling skills. The symptoms of mild to severe dehydration in football players include a dry, sticky mouth, drowsiness or fatigue, thirst, and reduced urine production. Along with water, sweating also causes the loss of electrolytes, particularly sodium and chloride.

diminishing curve. While they consume about the same amount of fat as their lighter teammates, they prefer to consume more PRO.

During football matches, players can lose a significant amount of sodium, ranging from 30 mmol/L to 62 mol/L, which is equivalent to losing approximately 3.9 to 6.1 grams of salt. It is important to note that thirst may decrease before the player's body is fully rehydrated. Proper hydration is crucial during a football game to replenish fluids los sweating. Keep in mind that gastric emptying may happen more rapidly than sweating. Therefore, starting to drink while playing football in a hot and humid environment is essential. It is also recommended to consume a sodium-containing fluid replacement beverage to prevent hyponatremia.

Optimal Nutritional Strategies

Adequate energy is the primary consideration when developing football diet plans. The performance of heavier football players on the ground is less impressive than that of lighter players. Thus, they are often tasked with positions requiring more strength and scrimmaging work than field mobility. Concerning their body mass, their energy and CHO requirements follow an exponentially An alternate explanation is that heavier players in strength-related fields prefer a higher-PRO diet. However, Figure 1 shows how the information about the optimal diet plan was prepared nutritionally before the competition to provide adequate glycogen reserves and hydration from the start of the event (14).

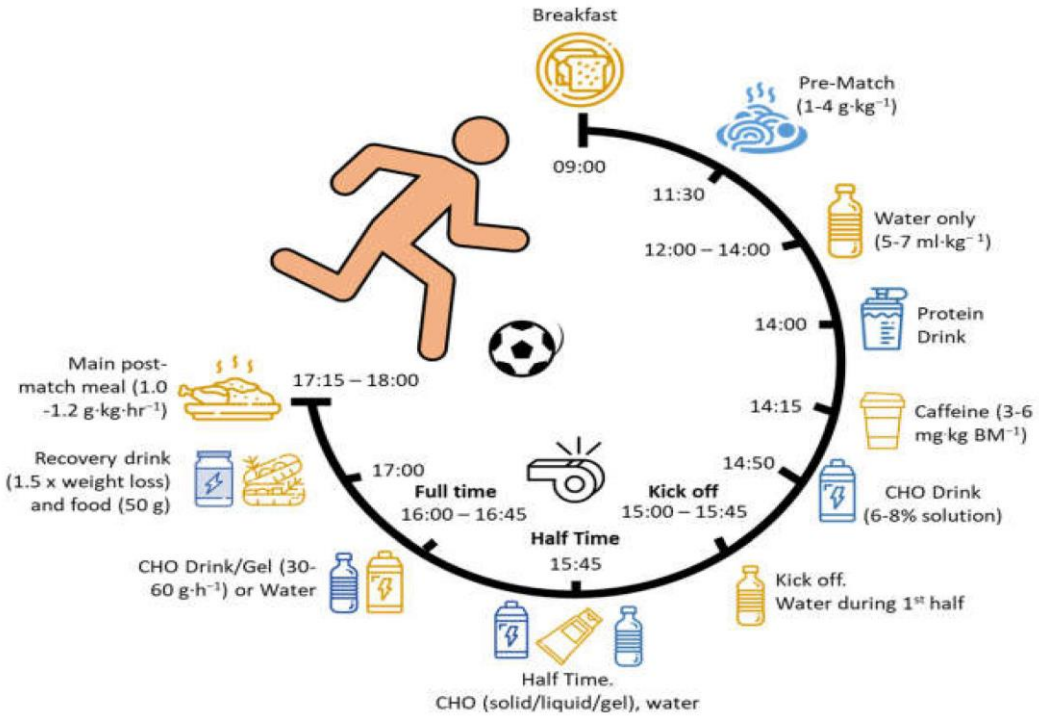

Figure 1. Schematic showing a typical feeding situation for a football player competing in a game beginning at 15:00.

Excellent sources of CHO include whole grains, legumes, fruits, starchy and fibrous vegetables, as well as dairy and vegetable kinds of milk. Use between 4 and 8 g/kg/day as a starting point, adding a bit extra for unique circumstances like twice-daily pre-season training sessions. Football players may decide to consume lean meats or vegetables if they are vegetarians. As with carbs, it is optimal to consume PRO throughout the day. The remaining energy budget should be made up of fats, including sources of necessary fatty acids such as cold-water fish or nuts and

Table 1. Recommendations for Daily Amounts of Macronutrients for Soccer Players.

Nutrient Type	Amount	Practical Considerations
Carbohydrate	5–10 g/kg/day	Adapt dietary objectives and periodization to the demands of daily training sessions; consider reducing CHO availability during low-intensity training sessions to enhance the metabolic benefits of exercise.
Protein	1.2–2.0 g/kg/day	Select a higher range during pre-season, after injury, after high-intensity exercise, and when the energy budget is low.
Fat		At least 20 percent of the recommended daily energy intake should come from fat.
Hydration		Consume enough fluids before, during, and after exercise to maintain health and performance; regular monitoring of first-voiding urine color is a helpful method for determining hydration status.

Energy is one of the primary issues when establishing nutrition plans for players in football teams (4). Their energy and CHO needs follow an exponentially decreasing curve (*see* Figure 2).

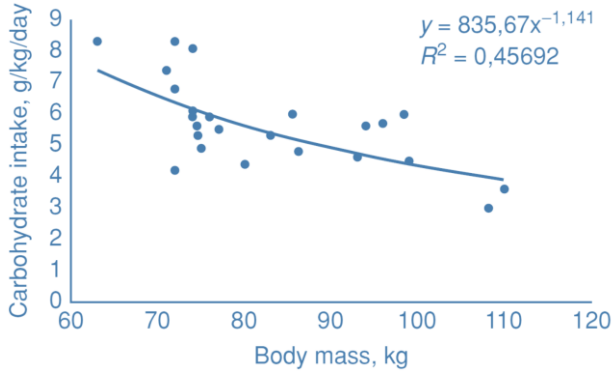

Figure 2. Reduced carbohydrate consumption compared to body mass in team sports athletes.

The daily requirements of macronutrients are summarized in Table 1. While their fat intake is similar to that of lighter teammates relative to body mass, their PRO intake shows a tendency to increase, so it might be the case that their PRO needs are more significant or that years of trial and error have led them to choose this macronutrient proportion (7, 11). A good starting point is between 4 and 8 g/kg/day, with a little extra for specific circumstances such as twice-daily pre-season exercise. CHO sources include whole grains, legumes, fruits, starchy and fibrous vegetables, and dairy or common plant milks. The remainder of the energy budget should include fats, such as the necessary fatty acids in cold-water fishes and nuts and seeds (16).

Football players can get their PRO from lean meat cuts or plants if they follow a vegetarian diet. These players often consume more than enough PRO to meet their demands, sometimes at the price of carbs. They need 1.2–1.6 g/kg of PRO daily, which is enough (9).

Pre-Competition

Football players and technical staff consider match-day dietary preparation a nutritional issue. These players generally emphasize pre-and post-match meals more than their everyday diet.

Figure 3. The potential possibilities for competition day diet plans are based on varying match start timings.

A pre-game meal should promote and sustain euglycemia as well as preserve glycogen storage and hydration. Failing to do so may lead to early glycogen depletion, hypoglycemia, fatigue, and reduced football performance. Furthermore, early kickoff periods need a single-feed strategy, whereas a two-feed strategy is possible for 15:00 kickoffs, and a three-feed strategy is preferred for 20:00 kickoffs (14). Enough CHO consumption on game day is of utmost significance for matches with earlier start times, but it is significantly less crucial for evening games. Figure 3 illustrates the possible options for match-day diet plans based on varying match start timings (14).

The quantity of CHO ingested influences glycogen synthesis, with 7-10 g/kg BM/day being the ideal intake for glycogen storage. Players often have a small breakfast before their main meal around noon if the competition starts in the afternoon. If the match is in the evening, the football players will have a late breakfast, a small lunch, and a pre-competition supper in the late afternoon (14).

They should begin competition on an almost empty stomach. Thus, they should eat CHO-rich meals to supply at least 1.0 g/kg BM throughout the 3–4 h interval before kickoff. PRO consumption is not regarded as a critical nutrient at the time before a competition. The meal should contain low-GI, complex CHO-rich foods for long-term stable blood glucose concentrations and general feelings of satiety, especially if adequate CHO has been consumed in the previous 24-36 hours before the match, as the GI of the meal is likely to have less of an effect on muscle glycogen content (7) Football players should avoid consuming unsuitable meals, such as those rich in fiber content or those high in PRO but high in fat, such as ground beef and dairy products. These PRO-rich sources take longer to digest and absorb. Therefore, they should not be consumed before extended, high-intensity activity (9, 10).

Table 2. Recommended Pre-training and Competition Amounts for Macronutrients in Soccer.		
Nutrient Type	Amount	Practical Considerations
Carbohydrate	1–4 g/kg	Adapt according to exercise requirements and individual tolerance; use a lower range if calorie restriction is a concern.
Protein	0.25–0.4 g/kg	Choose a quantity towards the upper end of the range when energy reserves are low and before resistance workouts.
Hydration		Improving the flavor of the swallowed liquids will aid in promoting fluid intake. Usually, 15 to 21 degrees is the ideal water temperature.

Within an hour before kickoff, a pre-game snack containing a modest quantity of CHO quickly digested and absorbed, such as dried fruit or CHO energy bars, may help preserve liver and muscle glycogen and stabilize blood sugar levels. Liquid-form CHO sources like fruit smoothies, yogurt drinks, fresh or canned fruit, and sports drinks should be favored closer to game time.

During Competition

The diet plan during a football match aims to maintain blood glucose and muscle glycogen to prolong energy production and postpone exhaustion. Adequate fluid intake, which does not cause the player any discomfort as it passes through the digestive tract and into their circulation, helps achieve this goal. Halftime is the best chance for players to recover fluids and CHOs lost throughout the game (6).

Table 3. Recommended Macronutrient Amounts during Soccer Training.		
Nutrient Type	Amount	Practical Considerations
Carbohydrate	No necessary if adequate carbohydrates are ingested prior to light football training.	Consider adding a small amount of protein to a carbohydrate drink when performing an afternoon session 8 hours following a morning session of intense training.
	During hard football training or having two sessions in a day: 30–60 g/kg	
Protein	Football may not be the sport that benefits the most from consuming protein while exercising, given that a typical training last less than 3 hours.	
Hydration	Consume adequate fluids to prevent (a) losing more than 2 percent of initial body weight and (b) gaining weight.	Athletes must be careful of their sweat rates. Adding a little salt may be necessary during extended training sessions in the heat.

In this respect, the most effective and practical method for consuming a mix of fluids, CHO, and electrolytes is to take a well-formulated isotonic sports drink containing 6–8 percent CHO or 30–60 g/h of CHO supplementation (6). This food decision is quickly digested and absorbed, aids in maintaining hydration status, offers substrate to postpone exhaustion, and preserves skill and cognitive function, hence minimizing performance decline towards the conclusion of a match (14).

Table 4. Recommended Macronutrient Amounts during Soccer Competition.		
Nutrient Type	Amount	Practical Considerations
Carbohydrate	30–60 g/h or small quantities or mouth rinse if a football player will compete for 30 minutes to one hour.	Sporting beverages should be consumed in small sips or rinsed. Before practicing in football matches, players must try that in football training.
Protein	Football may not be the sport that benefits the most from consuming protein while exercising, given that regular training lasts less than 3 hours.	
Hydration	ad-libitum hydration	It is essential if the player's pre-competition hydration level is deficient.

Other sources may include diluted fruit juices, high-CHO energy bars, fruit, water, and gels, albeit they are less suggested because they are associated with gastrointestinal discomfort unless the athletes have expressly educated their stomach to be accustomed to this method. Due to the significant increases in energy requirements, isotonic hydration is crucial for training sessions lasting more than one hour (14). By boosting glycogen storage, this supplementation was shown to allow for energy maintenance during the whole session.

Post-Competition

The primary purpose of recovery nutrition in football is to restore glycogen reserves and heal muscle injuries. Intake timing is critical for a fast recovery at this point. Due to its rapid absorption, whey PRO is ideal for ingesting immediately after exercise (14). When PRO and alcohol are consumed together, optimal myofibrillar PRO synthesis rates during recovery from exercise may be decreased by up to 24%. An initial recovery plan including the ingestion of 1.0–1.2 g/kg BM/h of CHO, potentially as a series of small snacks every 15–30 min for up to 4 h following a match, is essential to provide muscle cells with an immediate source of the substrate to initiate successful recovery (7).

Table 5. Recommended Macronutrient Amounts after Soccer Training.		
Nutrient Type	Amount	Practical Considerations
Carbohydrate	Follow the dietary plan for light football training to meet daily requirements.	Immediately after football training, begin refueling; monitor each football player's glycemic level to ensure high CHO availability.
	1.0–1.2 g CHO/kg/h for intense football training and two daily sessions.	
Protein	0.25–0.4 g/kg of protein is recommended after football training.	After high-intensity and/or resistance exercise, choose an amount towards the upper end of the recommended range.
Hydration	Hydration: Consume 125–150 percent of lost fluids.	Consuming salty meals and beverages may help the body retain water. Drink periodically rather than all at once.

This practice improves glycogen replenishment, stimulates insulin secretion, boosts glucose uptake and muscle glycogen synthase, and minimizes overall muscle discomfort. Additionally, the CHO and PRO strategy enhanced sprint performance by 3.7% and time trial performance by 8.5% 18 hours after the strenuous exercise session. A post-exercise football meal should consist of high GI CHO sources, such as fruit or juice, breakfast cereal, oats, or CHO-based sports dietary supplements in solid or liquid form.The optimal quantity of PRO to optimally promote muscle PRO synthesis is likely 20–25 g/kg BM, although it may be as high as 40 g in some people. A post-match meal ingested within four hours of the final whistle must include a low-fat source of PRO, such as chicken, potatoes, and vegetables, to meet the 3:1 co-ingestion ratio. In a glycogen-depleted condition, calcium release from the muscle sarcoplasmic reticulum was reduced when inadequate CHO was consumed during recovery.

Table 6. Recommended Macronutrient Amounts after Soccer Competition.

Nutrient Type	Amount	Practical Considerations
Carbohydrate	Less than 72 hours before the next competition: 1–1.2 g CHO/kg/h OR 0.8 g CHO/kg with 0.4 g PRO/kg/h.	Consume and hydrate while keeping in mind your unique diet plan and body composition objectives, as well as your upcoming athletic activities in football.
	More than 72 hours before the next match: ad libitum as long as daily requirements are met.	
	Private or single competitions are unrestricted.	
Protein	0.25–0.4 g/kg of protein is recommended after football competitions.	
Hydration	ad-libitum hydration	

Supplementation In Soccer

The American College of Sports Medicine, and the Academy of Nutrition and Dietetics of Canada classify dietary supplements into three groups (11). The methodology and practical suggestions for the individual performance supplements of relevance for football are shown in Table 7.

Table 7. Recommended Dietary Supplements in Soccer.

Supplement type	Reasoning for Intake	Recommendations
Sodium bicarbonate	Greater extracellular buffer concentration increases muscle H+ efflux into the bloodstream.	0.2–0.3 g/kg consumed 60–120 min before activity. It possibly causes digestive side effects.
Creatine	The maintenance of intracellular ATP levels. Enhancement in strength, muscular mass, and power.	0.1 g/kg or 5 g/day after training or competition. Provide 100 g carbohydrate or 50 g carbohydrate with 50 g protein for optimum absorption.
Nitrate	Reduce submaximal workout oxygen consumption.	6–8 mmol/day for 2–5 days before a competition and 90 minutes before the start of play.
Caffeine	Enhance mental and physical performance. Reduce perceived effort.	60 minutes before kickoff, provide 3-6 mg/kg.
β-alanine	Enhanced muscular buffering capacity delayed onset of fatigue—enhanced recuperation after repeated sessions of intense activity.	4–6 g each day for a minimum of 2–4 weeks. Avoid taking it just before a match and use split, lesser dosages (1.6 g), or a sustained-release formulation to lessen paresthesia.

Micronutrsients

A nutritional remedy should be explored if a player is recognized as having a particular micronutrient deficit, but a timely and effective cure is not always attainable. Vitamin D, iron, and calcium are often required micronutrient supplements for athletes. Supplements used for this reason should only be administered at the therapeutic dosage and for the shortest period necessary to restore optimal nutritional status (9, 11, 12). Players with restricted eating patterns, whether for religious, cultural, or ethical reasons, or due to restricted energy intake during periods of weight loss, may benefit from the use of a broad-spectrum, low-dose multivitamin and mineral supplement, but this should be evaluated on an individual basis.

These dietary supplements provide no substantial health risks except for continuous use and/or high dosages. Iron supplements may cause iron poisoning if used too often. Additionally, it should be acknowledged that athletes who self-prescribe dietary supplements to supply necessary nutrients are often the least likely to need them (19). Therefore, players are advised not to take their supplements but to take only those provided/recommended by the sports nutritionist or, at least, those approved by the team physician.

Iron

Iron consumption should equal or exceed the RDA for football players (>8 mg per day for males). When iron deficiency anemia is identified, clinical monitoring is required. Oral iron supplements, such as ferrous sulfate with 80 mg of elemental iron, may also be beneficial for correcting low ferritin levels (9, 10, 12).

Vitamin D

A deficiency in vitamin D may increase the risk of musculoskeletal injuries and stress fractures in football players. Two football studies failed to uncover a link between vitamin D and muscular strength. The prevalence of vitamin D deficiency (25(OH)D 30 ng/mL or 75 nmol/L) among football players residing at higher latitudes. Region-specific recommendations for vitamin D range from 200 IU in Australia and New Zealand to 600 IU in the USA and Canada. Foods such as fatty fish and egg yolks are dietary sources of vitamin D (5). Football players with inadequate vitamin D status need to take supplements containing at least 1500–2000 IU of vitamin D per day when safe sun exposure is not available or desirable.

Antioxidants in Soccer

The following are the most frequently cited reasons for antioxidant supplementation (19, 20): (a) exercise increases the production of reactive oxygen species, which can cause damage and, consequently, muscle pain; (b) some antioxidants have been shown to improve endurance performance and delay fatigue, and (c) some athletes may not meet the nutritional recommendations for antioxidant intake just by working out. On the other hand, some arguments have been used against antioxidant supplementation, including that regular exercise leads to increased enzymatic and non-enzymatic antioxidants in muscle fibers. The possibility that antioxidant supplementation may impair muscle function or delay some adaptations induced by exercise is interfering with cell signaling functions of reactive oxygen species, thereby affecting muscular performance (20-24). Additionally, evidence shows that antioxidant supplementation is not associated with improvement. Moreover, the preventive impact of a diet including natural antioxidant sources is not similar to the protective effect of supplementation. Due to the insufficient evidence to prescribe antioxidant supplements, athletes should concentrate on having a well-balanced and energetically appropriate diet, which may contain antioxidant-rich foods. Another review study is advised for further in-depth information addressing the effect of naturally occurring antioxidants on exercise. New ways for quickly ingesting antioxidants like vitamin E and N-acetylcysteine appear promising and may boost football performance (20), but further studies are necessary.

Summary

There currently needs to be more research exploring the nutritional viewpoints of Iranian coaches, which is crucial for developing a comprehensive nutrition intervention at the national level. It is essential to acknowledge that athletes in Iran often rely on their coaches for guidance on nutrition. Although there is a solid understanding of the physiological requirements of soccer players and the significant impact of nutrition on their performance, it is unfortunate that some football players still adhere to misguided dietary habits influenced by traditional beliefs As a registered dietitian nutritionist, it is crucial to emphasize the importance of closely monitoring and providing guidance on players' dietary strategies

Additionally, it is essential to collaborate with appropriate support personnel to develop efficient execution tactics. This lecture aims to offer Iranian soccer players accurate, evidence-based guidelines for nutrient and fluid consumption during training and competition to achieve optimal dietary patterns. In conclusion, incorporating the latest nutrition advancements will prove advantageous for football coaches and players in Iran. This strategic approach could enhance and elevate football programs within the country.

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Compliance with ethical standards

Conflict of interest None declared.

Ethical approval the research was conducted with regard to the ethical principles.

Informed consent Informed consent was obtained from all participants.

Author contributions

Conceptualization: D.T.; Methodology: D.T.; Software: D.T.; Validation: D.T.; Formal analysis: D.T.; Investigation: D.T.; Resources: D.T.; Data curation: D.T.; Writing - original draft: D.T.; Writing - review & editing: D.T.; Visualization: D.T.; Supervision: D.T.; Project administration: D.T.; Funding acquisition: D.T.;

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