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Differences in Diet Assessment and Body Composition among Young Spanish Elite Footballers: Morning Training vs. Evening Training

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Abstract: The training schedule is a factor that influences sports performance optimization. In a sport like soccer, there is often significant disparity in training schedules among different teams within the same club, without considering whether this may affect players' performance. The aim of this study was to describe differences in nutrient intake and body composition in elite youth soccer players from the Spanish league with different training schedules (morning and evening). A cross-sectional study was conducted to determine differences in anthropometric variables and dietary assessment in a sample of Spanish young soccer players. A total of 41 players participated in this study. After comparing the groups according to their training schedule, no differences were observed in body composition between both groups; the evening-night training group showed higher consumption of lipids and saturated fats. In summary, more experimental studies are needed to determine the effects on various health and performance parameters of different training schedules in young population.

Keywords: football; soccer; body composition; exercise time of day; training schedule

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1. Introduction

In football, clubs' youth academy teams usually have several groups per category, each of them often having different training schedules. Human beings exhibit circadian rhythms and diurnal variations in their physiology and the time of day they exercise, typically identifying as either morning or evening chronotypes [1]. There is still controversy regarding training timing; some authors have observed improvements in muscular adaptations and energy utilization during morning exercise [2–6], while muscular function has been favored in other studies when exercise is performed in the afternoon or evening [7–10]. In this regard, research exploring the potential effects of Exercise Timing of the Day (ETOD) on the body composition and diet of young athletes is not fully documented across multiple domains of applicability in daily life, justifying its assessment. For example, data regarding multimodal exercise regimens, psychological response, and potential differences in physiological response by ETOD [11,12] are scarce, and almost non-existent for healthy, exercise-trained individuals. Moreover, strictly controlled nutritional intake with adequate protein to promote recovery and exercise adaptation is often absent in ETOD interventions [1].

The time of day is a factor that influences the optimization of sports performance. Schedules are usually adjusted according to convenience or availability and resources. However, few studies have specifically investigated the effect of early morning versus afternoon-evening training on fatigue indices in performance. This is important from a sports perspective because circadian rhythms, player readiness, and alterations in sleep or meal patterns can affect performance [13].

The growth development and talent detection of an athlete can be determined through different measurement methods, with anthropometry being the most commonly used [14]. Anthropometry refers to the various measurements of the size and proportions of the human body [14–16]. One institution involved in disseminating anthropometry is the International Society for the Advancement of Kinanthropometry (ISAK), which was founded as an organization whose scientific and professional work is related to kinanthropometry [17]. Furthermore, anthropometric techniques stand out among various composition assessment methods due to their low cost, good reproducibility, and ease of application [15]. In fact, skinfold measurements and their sum seem to be the least affected by control factors (hydration intake and daily activity) compared to other measurement methods [18].

A balanced diet is recognized as an important factor in aiding the proper functioning of our bodies and thus maximizing training effectiveness. A crucial factor for athletes is the meeting of their energy needs, which we refer to as energy balance, i.e., when energy intake equals energy expenditure. This relationship influences sports performance and makes it vital that during physical activity, the organism's needs are met, including energy requirements, adequate intake of macro and micronutrients, and optimal hydration in accordance with the training plan, competition cycles, and other factors, such as exposure to cold, heat, high altitude, injuries, medications [19] or, as in the case of our study population, the time of day at which training occurs [9]. In addition, the group we are discussing consists mostly of young individuals still in development, who require adequate energy intake to ensure proper growth and development [20].

Given the scarcity of scientific research examining potential differences in the time of day (TOD) of training on body composition and diet in young elite athletes, who often have different training schedules due to the demands of their sport, the main objective of this study was to descriptively analyze potential differences in body composition and energy and nutrient consumption between the morning training (MT) group and the evening training (ET) group.

The aim of this study was to analyze differences in anthropometric characteristics, estimation of energy expenditure and consumption, as well as intake of macronutrients and micronutrients in elite youth soccer players from the Spanish league with different training schedules (morning and evening). Consequently, the initial hypotheses were as follows: Hypothesis 1 (H1): The time of day of training will reflect differences between the morning training group and the evening training group in terms of body composition. Hypothesis 2 (H2): There will be differences in nutrient intake due to different mealtimes between both groups.

2. Materials and Methods

Study Design. This is a descriptive, cross-sectional, and non-experimental study of anthropometric characteristics, estimation of expenditure and energy intake, and nutrient intake estimation in professional male soccer players under 19 years of age, from the first division of youth Spanish football, which corresponds to the highest category for this age group.

Participants. Participants belonged to two teams from the same Spanish club, both in the youth category. A total of 41 players participated in this study, consisting of 17 players from the morning training team (mean age: 17.65 ± 0.61 years) and 24 players from the evening training team (mean age: 16.87 ± 0.45 years). Inclusion criteria for the study were as follows: (a) being a healthy individual with medical authorization for federated sports practice; (b) belonging to one of the two teams in the youth category of the Spanish league; (c) being federated in football; (d) training at different times, either in the morning (8:00–10:30 a.m.) or in the evening (20:00–21:30 p.m.); (e) measurements taken in March, during the competitive phase. Exclusion criteria for the study were: (a) not being of the corresponding age for the youth category, 16–18 years old. All players were previously informed of the objectives and methods of the research, signing the informed consent document before starting the study. For underage players, legal guardians were informed, and they authorized the minor's participation through the corresponding informed consent.

Procedure. Evaluations were conducted during each team's training schedule. On the day of evaluation, it was necessary for players not to have performed high-intensity exercises, training, or stretching on the same day. Therefore, anthropometric measurements were taken before training. All players were familiar with the test procedures, as they regularly performed them as part of their routines. The various questionnaires administered to the players were explained beforehand, and any doubts were resolved to clarify and standardize their completion. With respect to training, both teams engaged in the same structured training program for the same duration.

Anthropometric Measures. Anthropometric measurements were taken following ISO 7250-1:2017 [21] and the International Society for the Advancement of Kinanthropometry (ISAK) standard [17]. The following measurements were taken: two basic measures (body mass and height), six skinfold thicknesses (triceps, subscapular, supra-iliac, abdominal, thigh, and calf), and three circumferences (arm relaxed, waist, and hip). An inextensible metal tape CESCORF (CESCORF, Porto Alegre, Brazil) was used to measure circumferences, and a Holtain mechanical caliper (HOL-98610ND) with an accuracy of 0.2 mm was used for skinfold measurements. All anthropometric measurements were taken two or three times, depending on whether the technical measurement error (TEM) between the first two measurements was greater than 5% in skinfolds and 1% in other measurements, taking the mean or median, respectively, for subsequent analysis. This ensures that the collected data are precise and consistent, which in turn guarantees the validity of the research results and allows for accurate interpretation of observed differences between measurements. The room temperature where the measurements were taken was standardized at 24 °C. Body composition was determined using equations described in the consensus document of the Spanish Group of Kinanthropometry of the Spanish Federation of Sports Medicine [22], following the four-component model (MM, FM, BM, and residual mass (RM)). The following equation was used: Faulkner [23] to calculate FM expressed as a percentage. Two health indicators were calculated: waist–hip ratio and BMI.

Questionnaires. 24-Hour Recall Questionnaire (R24h): this retrospectively collects and quantifies the intake of foods and beverages consumed during the 24-h period prior to or on the day before the interview. It allows estimation of the energy and nutrients provided by the subject's diet. On this occasion, three R24h were conducted for each player, on two different weekdays and one weekend day, as this improves accuracy. Experienced interviewers assisted participants with the completion of the questionnaire to try to make it as accurate as possible and avoid recall bias [24]. The DIAL program version 3.15 2021 [25] was used to assess the R24h, allowing the translation of foods into nutrients through its analysis.

Activity Record (24 h): In this questionnaire, the player describes how many hours per day they spend on activities of different intensities described in the questionnaire. With this information, we can estimate energy expenditure in 24 h using metabolic index (MET) units. The calculation was carried out as follows: METs of the activity × body weight (kg) × activity duration (hours) = kcal expended. Finally, the kcal expended in all the activities performed were added up and standardised to 24 h.

Statistical Analysis. The normality of the variables was analysed using the Kolmogorov–Smirnov test with the Lillieforts correction, and homoscedasticity was analysed with the Levene test. For the comparisons between groups of continuous variables, the nonparametric Mann–Whytney U test was used to determine differences in anthropometric and nutrient intake variables, depending on each group's training schedule. A significance level of $p < 0.05$ was established to determine statistical significance. Quantitative variables were expressed with the mean value, minimum, maximum, and standard deviation (SD). Statistical analyses were performed using the SPSS statistical package version 28.0.0.0.

3. Results

Table 1 shows a comparison of the anthropometric characteristics by training group. Statistically significant differences were not found between MT and ET groups for all the characteristics, except for BMI ($p = 0.004$) and supra-iliac skinfold ($p = 0.026$).

Table 1. Anthropometric characteristics of the study sample by training group.

Variable (Mean, SD)	Sample (*n* = 40)	Group		*p*	Min	Max
		Morning Training MT (*n* = 17)	Evening Training ET (*n* = 23)			
Weight (kg)	71.19 (5.78)	70.74 (5.19)	71.53 (6.28)	0.568	51.20	79.70
Height (cm)	178.01 (5.83)	176.29 (5.68)	179.28 (5.73)	0.874	167.00	188.70
BMI (kg/m^2)	22.45 (1.25)	22.74 (0.79)	22.23 (1.48)	0.004	19.65	24.87
Faulkner body fat (%)	11.63 (1.29)	11.78 (1.34)	11.47 (1.25)	0.894	9.49	14.13
Tricipital skinfold (mm)	7.92 (1.64)	8.06 (1.81)	7.81 (1.53)	0.322	6.00	11.20
Subscapular skinfold (mm)	8.62 (1.43)	9.02 (1.17)	8.31 (1.55)	0.921	6.00	13.80
Abdominal skinfold (mm)	10.59 (3.71)	10.44 (3.53)	10.70 (3.91)	0.867	5.40	23.00
Thigh skinfold (mm)	10.62 (2.49)	10.59 (2.33)	10.64 (2.65)	0.517	6.40	17.00
Calf skinfold (mm)	6.45 (1.35)	6.41 (1.26)	6.47 (1.44)	0.552	4.00	9.80
Supra-iliac skinfold (mm)	10.79 (3.71)	11.52 (4.36)	10.05 (2.87)	0.026	4.90	15.20
Arm relaxed (cm)	29.87 (1.93)	30.95 (1.54)	28.79 (1.69)	0.685	25.00	31.60
Waist (cm)	75.79 (3.25)	75.83 (3.18)	75.74 (3.41)	0.975	66.70	80.30
Hip (cm)	93.61 (3.46)	93.74 (3.30)	93.49 (3.71)	0.543	86.20	98.70
WHR	0.81 (0.03)	0.81 (0.03)	0.81 (0.03)	0.670	0.77	0.88

Regarding macronutrient intake, as shown in Table 2, neither group had an energy intake (EI) that matched their total energy expenditure (TEE), with the MT group having the highest total energy expenditure and ET group the highest energy intake. Statistically significant differences were found between the MT and ET groups for total energy expenditure (TEE). No statistically significant differences were found between MT and ET groups with respect to the macronutrient intake, nor for lipid profile. With respect to the caloric profile, % Lipid was higher in the ET group ($p = 0.042$).

Micronutrient intake means were compared between groups and against recommended dietary intakes (RDIs) for the general Spanish male population accordingly (Tables 3 and 4).

Regarding vitamin intake, only B12 showed statistically significant differences between the MT and ET groups ($p = 0.001$), with higher values in the MT group. Both groups exceeded the RDI for all vitamins, except for vitamin E, for which both groups met at least two-thirds of the RDI.

As for minerals, calcium ($p = 0.049$) and chloride ($p = 0.032$) showed statistically significant differences between the MT and ET groups, with higher intake in ET. Both groups exceeded the RDI for all minerals, except for calcium and iodine, for which both groups met at least two-thirds of the RDI.

Table 2. Macronutrients' daily intake by training group.

Variable (Mean, SD)	Sample (*n* = 28)	Group Morning Training MT (*n* = 15)	Evening Training ET (*n* = 13)	*p*	Min	Max
TEE (Kcal/day)	4440.70 (2438.24)	5385.86 (1734.97)	3771.21 (2667.80)	0.030	3082.54	8659.98
EI (Kcal/day)	3107.90 (535.05)	3024.87 (550.24)	3203.71 (521.87)	0.953	1983.33	3926.33
Protein, g	152.23 (32.20)	149.92 (32.01)	154.90 (33.50)	0.882	92.40	205.00
Proteins, %	19.81 (4.29)	20.29 (5.45)	19.25 (2.47)	0.155	11.49	35.97
Carbohydrate, g	312.11 (84.73)	303.49 (86.97)	322.06 (84.43)	0.723	108.33	436.33
Carbohydrates, %	39.80 (7.02)	39.48 (6.83)	40.17 (7.49)	0.511	21.85	47.88
Indissoluble fiber, g	14.78 (5.72)	15.46 (6.26)	13.99 (5.16)	0.530	7.07	28.03
Lipid, g	129.17 (24.65)	124.86 (20.61)	134.14 (28.66)	0.099	88.93	158.00
Lipids, %	37.60 (5.03)	37.41 (3.72)	37.82 (6.37)	0.042	28.95	41.46
SFA, g	33.50 (9.70)	31.57 (7.25)	35.74 (11.84)	0.098	17.23	42.30
SFA, %	9.70 (2.33)	9.48 (1.98)	9.94 (2.75)	0.128	5.74	12.13
MUFA, g	63.55 (10.94)	62.12 (10.29)	65.20 (11.85)	0.586	43.57	85.77
MUFA, %	18.57 (2.34)	18.64 (1.86)	18.49 (2.87)	0.120	13.32	20.39
PUFA, g	19.62 (7.75)	19.11 (5.58)	20.20 (9.90)	0.430	12.47	33.80
PUFA, %	5.69 (1.92)	5.68 (1.28)	5.70 (2.52)	0.151	4.50	9.89
Cholesterol, mg	539.65 (205.529)	503.47 (187.22)	581.40 (224.99)	0.458	248.67	907.00

TEE: total energy expenditure; EI: energy intake; SFA: saturated fatty acids; MUFA: monounsaturated fatty acids; PUFA: polyunsaturated fatty acid.

Table 3. Vitamins' daily intake and adjustment percentage to recommended dietary intake by training group.

Vitamin		Sample	Group		*p*	Min	Max
			Morning Training MT	Evening Training ET			
Thiamine	Intake, mg	2.59 (0.71)	2.58 (0.71)	2.59 (0.74)	0.841	1.53	3.70
	% RDI	215.65 (59.01)	215.17 (58.81)	216.22 (61.64)	0.841	1.53	3.60
Riboflavin	Intake, mg	2.85 (1.20)	2.89 (1.08)	2.82 (1.37)	0.693	1.57	4.90
	% RDI	190.26 (79.81)	192.44 (71.74)	187.74 (91.17)	0.693	1.43	6.10
Niacin	Intake, mg	77.11 (18.77)	78.77 (18.90)	75.20 (19.21)	0.580	4.13	121.00
	% RDI	514.07 (125.14)	525.12 (125.97)	501.32 (128.04)	0.580	46.23	105.00
B6	Intake, mg	4.22 (1.20)	4.41 (1.18)	4.01 (1.23)	0.812	2.43	6.90
	% RDI	301.66 (85.51)	314.76 (84.43)	286.54 (87.61)	0.812	2.27	6.80
Folic acid	Intake, µg	408.60 (124.35)	424.40 (137.13)	390.37 (110.38)	0.294	210.67	668.33
	% RDI	136.20 (41.45)	141.47 (45.71)	130.12 (36.79)	0.294	275.33	666.00
B12	Intake, µg	12.20 (8.83)	14.20 (11.22)	9.90 (4.20)	0.001	4.70	39.80
	% RDI	610.18 (441.27)	709.87 (561.07)	495.15 (209.99)	0.001	4.20	20.03
Vitamin C	Intake, mg	151.25 (77.32)	158.53 (86.64)	142.84 (67.47)	0.311	4.13	324.00
	% RDI	252.08 (128.87)	264.21 (144.40)	238.07 (112.44)	0.311	75.80	317.67
Vitamin A	Intake, µg	2403.88 (4489.67)	3118.36 (6111.79)	1579.49 (631.98)	0.075	601.67	24,913.67
	% RDI	300.49 (561.21)	389.79 (763.97)	197.44 (79.00)	0.075	395.33	2963.33
Retinol	Intake, µg	1421.87 (4543.10)	2171.61 (6177.69)	556.77 (633.76)	0.067	127.33	24,258.33
Betacarotene	Intake, µg	4475.14 (2508.39)	4339.30 (2721.65)	4631.87 (2337.83)	0.846	1.47	12,323.00
Vitamin D	Intake, µg	7.90 (7.30)	7.99 (8.32)	7.79 (6.25)	0.714	0.08	34.70
	% RDI	157.91 (145.95)	159.80 (166.36)	155.74 (125.02)	0.714	0.15	23.80
Vitamin E	Intake, mg	11.90 (3.04)	11.96 (2.83)	11.84 (3.38)	0.747	7.80	16.40
	% RDI	79.35 (20.28)	79.70 (18.88)	78.95 (22.56)	0.747	6.00	18.03
Vitamin K	Intake, µg	258.10 (147.98)	264.62 (146.78)	250.58 (154.98)	0.998	115.77	718.00
	% RDI	344.13 (197.30)	352.82 (195.71)	334.11 (206.64)	0.998	56.73	686.00
Pantothenic acid	Intake, mg	9.17 (2.89)	9.22 (2.72)	9.12 (3.18)	0.553	5.07	14.80
	% RDI	183.44 (57.77)	184.41 (54.43)	182.31 (63.63)	0.553	5.03	16.60

Note: Data are presented as means (SD). % RDI: adjustment percentage of recommended dietary intake for the general Spanish male population (14–19 years).

Table 4. Mineral intake and adjustment percentage to recommended dietary intake by training group.

Mineral		Sample	Group		p	Min	Max
			Morning Training MT	Evening Training ET			
Calcium	Intake, mg	967.14 (470.38)	949.07 (346.48)	988.00 (597.41)	0.049	422.33	1652.67
	% RDI	96.71 (47.04)	94.91 (34.65)	98.80 (59.74)	0.049	444.00	2329.00
Iron	Intake, mg	24.79 (9.28)	25.01 (8.70)	24.54 (10.26)	0.876	13.10	50.60
	% RDI	225.36 (84.38)	227.37 (79.11)	223.05 (93.30)	0.876	12.80	54.93
Iodine	Intake, µg	144.37 (66.09)	139.47 (57.60)	150.03 (76.77)	0.250	62.27	286.03
	% RDI	96.25 (44.06)	92.98 (38.40)	100.02 (51.18)	0.250	75.23	301.67
Zinc	Intake, mg	16.87 (4.08)	16.75 (3.63)	17.00 (4.69)	0.431	10.47	24.57
	% RDI	153.35 (37.08)	152.28 (33.02)	154.58 (42.63)	0.431	7.43	25.13
Magnesium	Intake, mg	449.85 (155.27)	458.02 (174.43)	440.42 (136.26)	0.834	265.00	965.33
	% RDI	128.53 (44.36)	130.86 (49.84)	125.84 (38.93)	0.834	244.00	702.00
Sodium	Intake, mg	3553.07 (1637.47)	3602.62 (1549.23)	3495.88 (1796.17)	0.368	1928.00	7119.00
	% RDI	236.87 (109.16)	240.17 (103.28)	233.06 (119.74)	0.368	1283.33	6769.67
Potassium	Intake, mg	4964.59 (1665.34)	4898.44 (1774.33)	5040.91 (1598.53)	0.899	2089.33	9797.67
	% RDI	160.15 (53.72)	158.01 (57.24)	162.61 (51.57)	0.899	3342.00	8157.33
Manganese	Intake, mg	5.49 (2.45)	5.85 (2.97)	5.06 (1.70)	0.375	1.87	14.63
	% RDI	249.38 (111.51)	266.03 (135.00)	230.17 (77.26)	0.375	2.43	8.30
Cobalt	Intake, µg	38.16 (89.73)	48.20 (113.31)	26.58 (53.51)	0.162	0.07	428.90
Cooper	Intake, mg	2.45 (1.27)	2.35 (1.30)	2.58 (1.28)	0.996	1.33	6.77
	% RDI	245.43 (126.88)	234.73 (129.50)	257.77 (127.85)	0.996	1.47	6.57
Nickel	Intake, mg	209.13 (316.05)	191.22 (276.92)	229.81 (366.63)	0.818	3.87	1127.33
Chrome	Intake, mg	67.12 (69.28)	60.88 (57.21)	74.31 (82.93)	0.499	0.53	253.83
Aluminium	Intake, mg	757.86 (527.61)	614.07 (424.10)	923.78 (600.69)	0.102	0.00	1575.00
Phosphorus	Intake, mg	2209.69 (584.34)	2235.93 (540.75)	2179.41 (652.13)	0.435	1274.33	3450.00
	% RDI	276.21 (73.04)	279.49 (67.59)	272.43 (81.52)	0.435	1278.00	3500.00
Chlorine	Intake, mg	2939.32 (1245.33)	2935.82 (984.67)	2943.36 (1535.65)	0.032	1282.67	4521.00
	% RDI	127.80 (54.14)	127.64 (42.81)	127.97 (66.77)	0.032	978.33	5451.00
Fluorine	Intake, mg	342.33 (169.32)	283.56 (144.72)	410.13 (175.43)	0.785	18.97	538.67
Selenium	Intake, mg	229.93 (75.17)	222.86 (78.98)	238.09 (72.80)	0.882	136.40	420.00
	% RDI	459.87 (150.33)	445.73 (157.96)	476.18 (145.60)	0.882	101.17	338.00
Bromine	Intake, mg	579.31 (592.22)	517.64 (531.98)	650.47 (669.87)	0.109	0.04	1558.00

Note: Data are presented as means (SD). % RDI: adjustment percentage of recommended dietary intake for the general Spanish male population (14–19 years).

4. Discussion

The aim of this study was to analyze differences in anthropometric characteristics, estimation of expenditure and energy consumption, as well as intake of macronutrients and micronutrients in elite youth soccer players from the Spanish league's youth category with different training schedules (morning and evening).

Considering football players grouped by morning or evening training, anthropometric characteristics did not show significant differences between both groups. Regarding estimated body fat percentage, values were around 11.5% in both groups, which align with findings from various studies conducted using DXA, where the range observed falls between 8–13% [26,27].

Regarding Total Energy Expenditure (TEE), results showed statistically significant differences between the morning training group and the evening training group, with TEE being much higher in the morning training group (5385.86 kcal/day) compared to the evening group (3771.21 kcal/day). These results are consistent with another study where the morning training group showed an increase in TEE consistent with prescribed exercise, while the evening group had a muted increase in TEE [28].

However, no significant differences were observed in energy intake, with the mean intake being 3108 kcal/day for both groups. This poses a risk for the morning training group and could be explained by activities performed apart from training in individuals with morning versus evening habits. This energy imbalance could lead to low energy availability in players, common in young athletes, as several studies show, where the prevalence of Low Energy Availability (LEA), defined as energy levels below 30 kcal·kg FFM-1·day-1, was 56% and 47.6%, respectively [29,30].

Carbohydrate intake is low in both groups, with no significant differences between them. Both the morning and evening training groups deviate significantly from the Mediterranean diet pattern (MD), which recommends 55–60% of energy intake in the form of carbohydrates. The average carbohydrate intake in youth players from this club is 40% of total energy consumption. This represents poor efficiency for performance and potential poorer recovery due to inadequate replenishment of glycogen stores used during sports practice. In this regard, research indicates that the importance of carbohydrates in football has been recognized since the early 1970s. Players starting the game with higher muscle glycogen reserves, by consuming sufficient carbohydrates, achieved higher movement intensities and were able to maintain better total distance covered between rest times than those who started with low reserves [31].

When comparing fat consumption between both groups, statistically significant differences were found, with both groups consuming above 37%. The evening training group had a higher fat intake, ingesting 37.8% of total energy in the form of fats (134 g on average versus 124 g on average for the morning group). Players training in the evening consumed a greater amount of saturated fatty acids (SFAs); in this regard, another study observed an increase in lipid and saturated fatty acid intake when dinner was shifted to later hours or when the chronotype is evening [32].

Body lipid levels are under circadian control, involving numerous "peripheral clocks". Fat-rich foods are considered potent chrono-disruptors because they act by modifying the expression of circadian or "clock" genes, which activate or deactivate other factors leading to physiological changes in cells over 24-h periods [33]. Therefore, a high-fat diet causes circadian desynchronization with metabolic disturbances that are detrimental to athletes' health [34].

Protein consumption in this population exceeds the recommended intake by the Mediterranean diet of 10–15% of total dietary energy in the form of proteins, with consumption around 20% in both groups. In this regard, higher protein intakes seem to enhance training adaptations [35]. These intake levels can be easily achieved through a varied diet, if energy intake is sufficient to meet training demands [36].

Regarding vitamin D, both groups showed excess consumption of this nutrient when compared to the Recommended Daily Allowance (RDA). In this case, the morning training group would have a higher risk, as they are more exposed to sunlight than the evening training group, so the recommendation could be to consume a lower amount of vitamin D in this case, as reducing calcium and vitamin D intake in the diet is effective in treating adverse effects of excess consumption [37–39].

5. Conclusions

In this descriptive study conducted on young elite soccer players with different training schedules, the following conclusions can be drawn: (1) No significant differences were found in body composition between the group training in the morning and the group training in the evening, except for the supra-iliac skinfold; (2) Significant differences were observed in total energy expenditure, with the morning training group exhibiting significantly higher expenditure compared to the evening training group. However, there were no differences in energy intake between groups, indicating a risk of low energy availability (LEA) in the morning training group; (3) Total intake of lipids and saturated fatty acids was higher in the evening training group, potentially explained by the shift in intake to later hours; (4) Further studies are needed to determine the effects of different training schedules, particularly on young elite athletes, and how they affect various health and performance parameters, such as diet, training, and rest. Regarding the latter, a study on the chronotype of these players, as well as their circadian rhythms and sleep–wake patterns, would be important.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee of the University of Granada (protocol code 3340/CEIH/2023, 18 May 2023).

Informed Consent Statement: All of the volunteers signed informed consent forms to participate in this study, which was approved by the Ethics Committee of the University of Granada.

Data Availability Statement: There are restrictions on the availability of data for this trial, due to the signed consent agreements around data sharing, which only allow access to external researchers for studies following the project's purposes. Requestors wishing to access the trial data used in this study can make a request to mariscal@ugr.es.

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