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The importance of nutrition in the training of young footballers.

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Abstract

Training is the physical preparation of athletes for a competition. In this preparation, specific nutrition must be included to have a supply of energy necessary for the body and the muscles in order to achieve a good performance. It is possible to know what is the diet that footballers should follow during the training period to have a better performance? This is why the purpose of this study is the importance of nutrition in order to improve the level of performance of young footballers and to determine whether the impact of following an adapted food plan influences performance. The aim is to provide an in-depth understanding of the importance of nutrition in the training of young footballers and to offer practical strategies to maximize their sporting potential through a balanced and healthy diet.

1. Introduction

The demands of sporting success are more and more specific and require special attention with regard to the choice of parameters which directly and indirectly influence sporting performance, i.e. among the most determining endogenous and exogenous factors of athletic performance. Football is the most popular sport in the world, where talented, motivated and well-trained players meet; attention to detail can make all the difference. Among the exogenous factors, nutrition is a key element of training for young athletes in general and footballers in particular. A balanced and proper diet can help improve performance, prevent injury and aid recovery. A footballer's performance depends on the correlation of several parameters (Laurier A., 1993). According to Kowacs S. (1975), these parameters are related to training, recovery and lifestyle factors as well as the player's behavioral and psychological tendencies. Kruse R. (1977), argues that quality as a determinant of a player's social personality is important in top-level football. Athletes need an adequate supply of nutrients to support their growth and development, as well as to meet the physical and mental demands of their sport. Key nutrients include carbohydrates for energy, protein for muscle recovery and building, fats for energy and brain health, and vitamins and minerals to support overall health. Additionally, adequate hydration is essential to maintain performance and prevent dehydration, which can negatively affect performance and health (Koceir E.A, 2022).

A balanced and appropriate diet is essential to maximize the potential of expectants and enable them to perform to the best of their abilities. This work focuses on the importance of nutrition in the training of young footballers. We will explore the key nutrients needed to support their performance, methods to assess nutrient intake and strategies to encourage healthy eating in young footballers.

We will also look at the nutrition challenges young footballers face, such as time constraints, food preferences and pre-existing eating habits. Finally, we will discuss the practical implications of optimizing nutrition for improving the performance of young footballers and reducing the risk of injury (Wrzos J. 984) . In addition to the conditional basics and the excellent state of health required by performance capacity, top-level football has basic skill requirements such as:

✓Versatility (adapt to various situations and roles),
✓the ability to correctly assess game situations,
✓Technical ability to respond to the most delicate game situations,

✓Willingness to duel and perseverance in all tactical situations.

The study carried out by Goubet, P. (1988), on morphological characters in the achievement of performances reveals that many trainers lend them very little influence. But it is certain, as estimated by Angonese, P (1990), that they interfere and act in the efficiency of the game of the players, indeed,

Toumanian, G.S. (1971) suggests directing the choice towards medium-sized footballers because of the low position of their center of gravity. This fact, according to this author allows a better control and fluidity of the movements of the body from where the idea that the high size can limit the technical virtuosity of the footballers. Football places high demands on the physical preparation of players in order to meet the needs expressed by the progression of the game and the positions occupied in the team. In fact, taking into account the basic movements of football (playing without the ball), changes in the rhythm of the game and irregular technical and tactical movements. Therefore, football players need a very good level of endurance (Klante, R. 1993).

Nutrition is directly related to food, which is used to meet the nutritional needs of the body. It is important to maintain good eating habits to maintain good health. In addition to energy needs, footballers have other more specific needs such as trace element and mineral salt needs, vitamin needs, water needs (Blanc J.P. 1991).

2. Research Methodology :

Problematic : In sports, the new demands placed on sportsmen are long and intense training sessions, which considerably disturbs the body's metabolic processes. Energy resources are depleted and the replenishment of these resources expended during the athlete's physical effort is only possible with a substantial intake of food. Sports nutrition varies according to the sport practiced, as well as the variation in training loads for competitors. Sports nutrition is subject to some basic rules. Its relationship with performace is most obvious in w sports such as soccer.

Hypothesis : We assume that mastering a diet appropriate for intense sport practice can help the athlete achieve their best performance without excessive fatigue.

The study focused on 10 young footballers, aged 20 to 27, playing at a Reghaïa club belonging to the third division of the Algiers Regional Football League. Thus, this club, which allowed us to have an experimental field, by putting under our responsibility both the players and the coaches. According to their experiences, all these young footballers trained regularly

between 3 and 5 hours per week (average of 4 hours per week). The 10 players selected were submitted to a questionnaire for the first time, in April of the year 2023. It should be remembered that all the young footballers concerned by the study practiced regular training and took part in official competitions.

We assume that following a specific food plan dedicated to each player according to their body composition and their daily energy expenditure will lead to an improvement in their physical abilities as well as improved performance in training and competitions.

For our study, we used the following methods :

Questionnaire assessment method : The questionnaire includes several short and very well explained questions to allow the athlete to answer correctly and effectively to the questions asked. The first part of the question dedicated to the total parameters is asked for the collection of general data on the players (age, weight, height). Some questions inform us to have a precise idea of the number and hourly volume of training of the players over a week and the nature of the training sessions, during the different periods of the preparation of the players. It is possible to know whether algerian players are subject to nutritional monitoring within their club and the periods during which they benefit from this nutritional monitoring. They help us understand the eating habits of footballers, in addition to collecting information on the distribution and nature of meals, hydration, snacks, food supplements and vitamin supplements they consume.

Anthropometric method : The anthropometric method allowed us to collect data relating to the body constitution. We calculated :

• Surface of the body using the equation of Izakson (1956) : SA= 1+P + (T-160) /100 T: height in centimeters; P: the weight in kilograms; Constant: 160.

The size of the surface of the human body is taken into consideration when assessing physical development. It is estimated that greater this index, better is the physical development.

• Quételet index (1869) : This index is used to assess the physical development of athletes. Higher is the index, better is the physical development : Q=P/T (g/cm) ; P : weight in grams; T: height in cm.

• Body mass index or BMI: BMI= P/ T2. To determine how much an individual is either too light or too heavy, we can calculate their ideal weight using Davenport's Body Build Index, also called Kaup's index: in which we

divide the weight by the square of the height. To interpret the results, the following Davenport scale can be used :

- ✓ Very skinny 14.0 to 18.0
- ✓ Skinny 18.1 to 21.4
- ✓ Average 21.5 to 25.6
- ✓ Corpulent 25.7 to 30.5
- ✓ Obese 3 .05 and more.

Statistical Analysis

To interpret these results, we used descriptive statistical calculations, namely the arithmetic mean; the standard deviation ; the coefficient of variation. The coefficient of variation expresses the value of the standard deviation as a percentage of the mean: CV ≤ 10%; great homogeneity; CV between 10% and 20%; medium homogeneity. CV ≥ 20%; low homogeneity.

3. Results

We report here the results of the various questions submitted to young footballers.

Table I : Training frequency per week

Number of training	3 Times	4 Times	5 Times	6 Times
Responses	0	8	2	0

To the question of the number of training per week, 80% answered that they train 4 times per week and 20% train 5 times per week, in accordance with the answers of the trainer. We notice that the majority of players prefer to train only 4 times a week. The average duration of training is 4 to 6 hours for all footballers of this club.

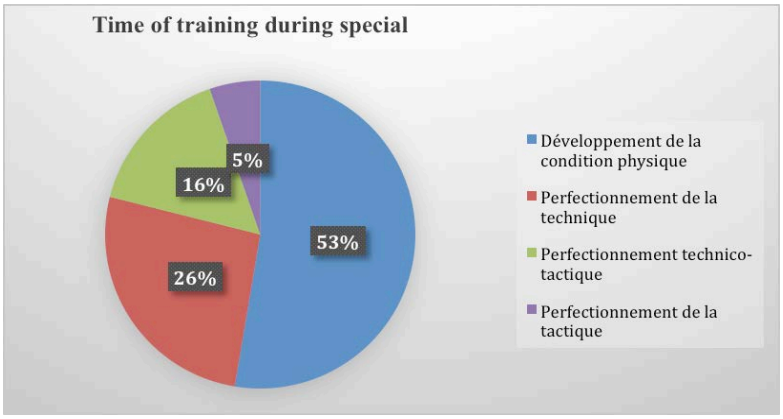
Table II: Training session during general preparation

Training session	**Pourcentage**
Fitness development	60%
Improvement of technique	20%
Technical and tactical improvement	15%
Tactics improvement	5%

60% of the training time during the general preparation period is granted to the development of physical condition while 20% is granted to the improvement of technique, 15% is granted to the improvement of technical-tactics and 5% is granted to tactics. So we notice that the majority of the training time targets more the physical and technical development which is important for the players to better lead the match.

During the special preparation period

As shown in Table 1, the mean scores of experimental and control groups are nearly the same, indicating equality of two groups regarding their knowledge of targeted structures.



50% of training time during the general preparation period is granted to the development of physical condition while 25% is granted to the improvement of technique, 15% is granted to the improvement of technical-tactics and 5% is granted to tactical preparation.

During the competitive period

Table III: Nature of training session during the competitive period

Nature of training session	**Pourcentage**
Fitness development	25%
Technics improvement	15%
Technico-tactics improvement	30%
Perfection of tactics	30%

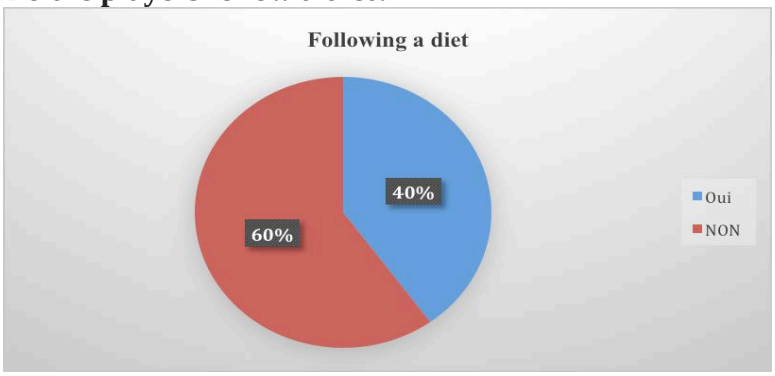
We note that the majority of the training time during the general and specific preparation period targets more the physical and technical development which is important for the players to better lead the match; while the pre-competitive and competition period focuses more on technique and tactics, without forgetting the great importance given to physical preparation which is logical because the players seek to give their best to score goals and win the match.

Table IV: Nutritional plan within the club

	Yes	No
Before and after the competition	**10**	**0**

The absence of a nutritional plan is due to the total absence of follow-up by nutritionists within the amateur club.

Do the players follow a diet?



Les paramètres nécessaires sont manquants ou erronés.

The majority of players do not diet due to lack of guidance and advice on the importance of dieting. The footballer should know the importance of food before preparing for any competition or training in relation to the fact that his body is facing a difficult test. It is therefore essential to provide him with certain food reflexes.

Composition of meals :

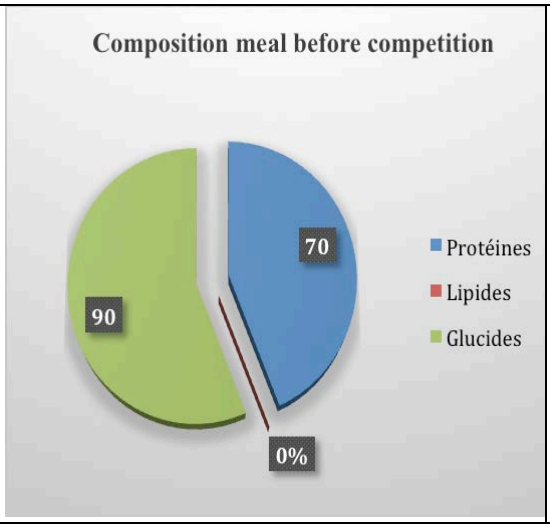
Table V : Food ration of meals before and after training

Before	Proteins	Lipids	Carbohydrates
	18%	8%	74%
After	Proteins	Lipids	Carbohydrates
	15%	10%	75%

Despite their poor knowledge of nutrition, some players know the importance of meals before training. We notice that carbs and proteins make up the majority of the meal. 74% of carbohydrates are from oats, bananas, dates, and 18% of proteins from different sources such as eggs and oats. A minority of players take coffee which is a good stimulant for the body before training or/ and milk. Most have a balanced and varied meal rich in vitamins and minerals - B vitamins, Vitamin C, and potassium.

After training, we observe that players take meals rich in carbohydrates 75% such as rice, fruit juice, the amount of protein 15% are also important such as white meat and eggs because proteins are necessary for the muscle construction, we also note that the amount of lipids consumed is 10% other nutrients, and observe that the meal contains an adequate amount of fiber from vegetables and fruits

Before competition :

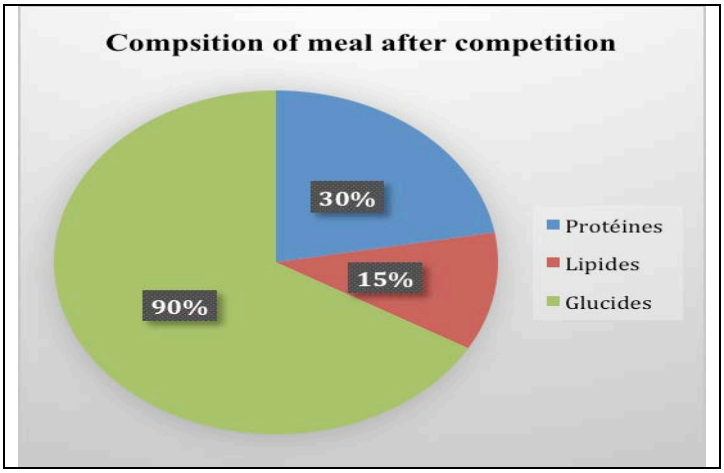


Proteins	Lipids	Carbohydrates
70%	0%	90%

Before a competition the players take a significant amount of carbohydrates which is 90% with a quantity of 26% in proteins, whereas we note a total absence of lipids. Glycogen storage must be optimized according
to Boudot C. (2021), to achieve this objective. Current recommendations recommend the ingestion of 6-8g/kg/day of carbohydrates in the 24-48 hours preceding the match. The available literature shows that the average carbohydrate content of the pre-match meal (<1.5g/kg body weight) was below recommendations (2-3g/kg body weight). However, this might not be a problem if training loads decrease from two days before the game and carbohydrate intake stays about the same. Since the mid-1990s, protein intake recommendations for soccer players have consistently been between 1.2 and 2 g/kg/day. Before the game, players take very little fat in accordance with the recommendations of specialists who say it is important to monitor fiber and fat consumption because of their potential effects on

slowing gastric emptying, altering absorption nutrients in the small intestine and the appearance of gastrointestinal discomfort.

After competition :



For the composition of the meals after the competition, the footballers mainly consume fruit juices to rehydrate quickly. It is preferable to take alkalizing foods which are rich in bicarbonates to fight against the acidity and this will allow after a match recover in better conditions. The amount of protein is low and low intake of lipids, which suggests that players give less importance to lipids and proteins than to carbohydrates.

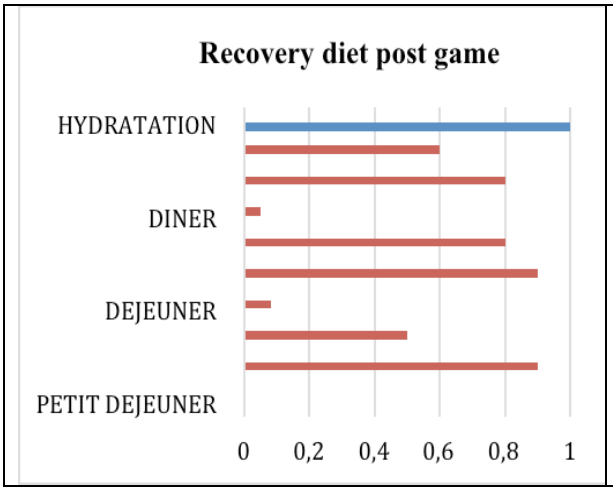
Nature of food supplements or vitamins used

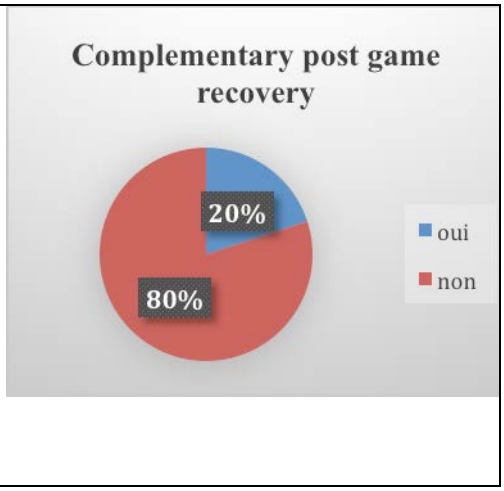
Table VI : Food supplements or vitamins used

Yes	**No**
2	**8**

THE WHEY was taken by two players. We notice that the majority of players do not take food supplements and even if footballers eat a balanced diet, there will always be deficiencies. There are situations in which the use of dietary supplements can improve performance, recovery and general health. However, they should never be consumed to replace a balanced diet but rather to complement it. The only dietary supplement used by the minority of footballers is the **whey**. It is a protein taken after training or a match, to help rebuild muscles and recover better, but care must be taken to respect the doses.

Post game recovery diet :





The recovery diet, which is an essential step after a match, consists of a high pourcentage of carbohydrates throughout the day, for the resynthesis of glycogen stores and to promote muscle reconstruction. The pourcentage of protein that is low at breakfast (5%) is mostly higher during the day. It is advisable to take a protein-rich amount for muscle mass repair. There is also a very low percentage of lipids. Their consumption is not recommended in the hours preceding and following a competition. Regarding hydration, each player will be severely dehydrated at the end of a match due to their sweat, which leads to a large loss of electrolytes or more generally of mineral salts and promotes the acid-base balance, it is therefore essential to hydrate properly. Finally, for food supplements, only 20% of footballers take them during the recovery period, even though they are essential for muscle regeneration and shortening the recovery period.

Analysis of anthropometric parameters

Table VII : Total Parameters

	Age (years)	Weight kg	Height cm	IMC
Mean	24,2	72	179	22,56
SD	3,85	5,56	0,05	1,35
CV%	15,92	7,72	3,03	6,00

The analysis of the total parameters informs us about the constitution of young footballers. The group presents an average homogeneity in terms of

age with a coefficient of variation of 15.92%. In terms of height, the group of footballers presents a very high homogeneity (CV: 3.03%) as well as in terms of weight. (CV: 7.72%).

Table VIII : Indexes of physical development

	S = m2	P/T	IMC
Mean	1,92	40,29	22,56
SD	0,06	2,5	1,35
CV%	2,89	6,21	6,00

The analysis of the physical development indices shows a great homogeneity between all the players, denoting by the influence of the training.

4. Discussion

The Algerian sportsman has particularities on the cultural, social level, therefore on the food and nutritional level. The circumscription of its geographical and cultural environment is determining as for the availability of food or products. The analysis of the results obtained in this study reveals that the players train one session per day, 5 days a week for a duration of 1h30 to 2h per session; which meets the minimum training time threshold for a competitor. Indeed, it is important to ensure that the players have a good athletic base allowing them to be present at training sessions, cup and championship matches, hence the need for regular check-ups in order to optimize the possibilities of maintain performance.

As for food behavior, it should be noted that there are deficiencies and poor food hygiene on the part of the players. The truth is that even if they have an idea of the importance and quality of the food they consume (78.7%), and they eat for taste or food need among others. These players must make corrections to certain attitudes such as: varying the number of daily meals (from 3 to 4 per day) but also the hours of ingestion which fluctuate and developing an adequate diet before and after competitions in order to ensure a good compensation that can provide all the necessary minerals after the efforts. Indeed, if the footballer's basic diet requires four fundamental groups which are: milk and dairy products, meat and protein-rich products, fruits and vegetables, cereals and fats (Dupin et al. 1992). We will find that that of our players is in perfect harmony if we rely on the results of the frequency of ingestion of the different food groups by the players; this should also ensure a caloric distribution of 60 to 65% carbohydrate 17% protein and 18% fat. Diet is fundamental because well-trained players should not show any fluctuation in body weight Doucet, 2005). They should

monitor and verify their daily ration to ensure they are consuming the appropriate number of calories and maintaining their body weight stable. As for the water intake, our footballers report that they are big consumers of liquid (mineral water, tap water, fruit juice and to a lesser extent tea and coffee. Players do not know how to compensate for their water losses; content to drink when they are thirsty. These habits are to be banned to the detriment of the recommendations of nutritionists who suggest drinking before, between and after exercise but at regular intervals to avoid gastric complications. The contribution of leaders and coaches has enabled us, in this study, to say that indeed there is no food policy based on rigorous local products despite their knowledge in this area, the interviews they hold with the players .

Conclusion :

Food, sport, health are closely linked and nutritional information that helps to change eating behavior is one of the best preventions. A fit body is not the work of the last moments but of a healthy lifestyle. Indeed, for athletes, dietetics or food science has a double interest: improving performance during exercise and allowing rapid recovery after exercise. Thus, the food behavior of the footballers as a whole is satisfactory even if deficiencies and incorrectnesses are noted on their food hygiene. The frequency of ingestion of the different food groups made it possible to ensure the caloric intake or daily energy needs of the players. Ultimately, the players present a satisfactory profile which was decisive in the different stages of the test. Their physical abilities testify to the good preparation and programming of training according to the calendar. And this cannot continue without the minimal contribution of an adapted dietetics. The water ration, on the other hand, is reassuring with intakes before, between and after efforts, which would avoid any possibility of disturbance of digestion even if some drink badly. We suggest that further studies be initiated across all clubs in the national championship. Indeed, this study will make it possible to support the new dynamics of reorganization of our football and to become aware of the importance of dietetics in the care of athletes.

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