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# *PPGarden, an initiative to improve nutrition in athletes*

## *PPGarden, una iniciativa para mejorar la nutrición en los atleta*

## *PPGarden, uma iniciativa para melhorar a nutrição de atletas*

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According to theorists who have studied the conditions in which an athlete must be trained, nutrition is among the three most important factors needed to practice a sport (Gonzales *et al.*, 2006; Onzari, 2008); the other two are attributed to the particular genetic factors of the athlete and the type of training performed. The food provided to an athlete not only seeks to provide the energy necessary to maintain adequate performance, but also seeks to guarantee sufficient material for the strengthening and repair of tissues; on the other hand, it helps preserve and regulate metabolism. All sports do not demand the same type or amount of food, some, such as soccer and cycling, require foods that provide prolonged energy and others, such as weight lifting, bodybuilding or gymnastics, require much more kilocalories to withstand physical efforts in Extreme situations.

Regarding the nutritional balance that must be taken into account to achieve a successful sports diet, writings appear in scientific literature such as that presented by Bofanti (2019), who considers that an adequate supply of carbohydrates in the diet should prevail, since that this nutrient acts as the main energy fuel for both the aerobic and anaerobic pathways.

The inclusion of protein in recovery meals also appears as a crucial strategy for the optimal regeneration of muscle fibers damaged during training and matches, and its intake should begin in the early post-exercise phase. Not only are these recommendations limited to the moments before or after competitions, match days also require specific nutritional planning. These especially facilitate recovery when the competitive schedule involves more than one match in the same week.

Regarding this topic of sports and nutrition, the work of Antuñano *et al.*, (2019) is presented, which is undoubtedly one of the most complete when it comes to visualizing which are the most important nutrients that act on the athlete's metabolism, as well as a group of recommendations that are provided for correct nutrition for athletes. In summary, it is proposed that among the most common minerals consumed by an athlete are iron, zinc, selenium, manganese, chromium, iodine and copper.



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However, there are other chemical elements that play a significant role in the body, for example, potassium, this is an intracellular cation that intervenes in the acid-base balance, muscle contraction and neuromuscular activity.

Potassium consumption should be estimated between 3-4 g, without exceeding 5-6 g. of this chemical element. The deficiency of this valuable component could be caused by vomiting, diarrhea and urinary losses due to laxatives or diuretics. Hypopotassium consumption, on the other hand, could affect the neuromuscular system to the point of paralysis, cardiac arrhythmia and cardiac arrest. Another fundamental element is sodium, which in this case the threat is due to excess, since it is frequently found as a seasoning in culinary preparations. It is for this reason that national and international organizations have advocated requiring a reduction in sodium consumed in the diet. Magnesium is another mineral that is distributed in the body as part of the skeleton (59%), muscle tissue or soft tissues (40%), and extracellular fluid (1%). Calcium is another that intervenes in energy metabolism, muscle contraction, neuromuscular excitability, nerve conduction and blood coagulation.

Among other important information that cannot escape this work: Iodine plays an important role in the release of energy, in the production of thyroid hormones and in nervous and cognitive function; Copper is found mainly in the liver, brain, heart and kidneys. The foods richest in copper are animal liver, seafood, fish, nuts, cocoa, seeds (wheat, oats), soybeans and vegetables. Despite its frequent presence, it is not considered an element with potential risk of deficiency within a varied and balanced diet in adults.

Regarding the presence of vitamins, such as E and C, it is noted that these can promote tolerance to effort during physical exercise due to their antioxidant properties, or due to their action on the immune system. Studies confirm the necessary presence of vitamin D in its metabolic function of skeletal muscle, the prevention of injuries, the improvement of neuromuscular performance and the control of fatigue.

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As part of the recommendations found in this study corresponding to de Antuñano *et al.*, (2019), it is evident that the athlete must consume an adequate, varied and balanced diet in quantity and quality to optimize adaptation to training and competition.

Regularity in food intake and correct adjustment to sports activity schedules is very important. The consumption of hydrocarbons is recommended before, during and after physical exercise, in cases of intense efforts lasting more than 1 hour. It is recommended to drink between 250 and 500 ml of water or sports drink two hours before the start of sporting activity.

A year after the publication of the work belonging to de Antuñano (2019), the work of Carrasco, (2020) is presented, which, although it also refers to nutrition in sports, dedicates its intention more to the combination between Nutrition and Hydration. In this research, four elements that nutrition provides for sport become clear: 1) it provides energy, 2) it provides the body with nutrients, 3) it strengthens damaged tissues and 4) it helps regulate metabolism. One of the most innovative aspects in this work is the consideration that arises when it comes to hydration in sports, whether through breathing or sweating. Therefore, it is important to know when we are in a situation of gradual loss of water in the body, these ways are the following; 1: for weight loss, 2: for the feeling of thirst and 3: for urinary density. (This density is generally represented by the color of the urine)

With González's masterpiece, (2020) chapter 8, page 91 titled Nutrition and Sports is exhibited. The objective of this chapter is about the relationship between these two factors mediated by physical activity and the energy capacity that must be possessed to successfully carry out training, competition or simply physical exercise. There are some details that are shown in this relationship, but one that should not be overlooked in this writing stands out and is about the most common diagnoses in sports associated with nutrition and this revolves around three fundamental signs or symptoms: 1) excess or body fat deficit 2) poor intake before and/or after training and 3) hydration deficit during training.

Closing ranks regarding the most important contributions of each work, we find in Hernández, (2021) a selection of suggestions to be taken into account if it is about nutrition in sports; Among them we can mention:

- Fat intake is recommended around 25%.
- Protein intake is recommended around 1.3-1.6 g/kg/day.
- Energy needs are calculated above 2900 kcal/day.
- Regarding micronutrients, special attention should be paid to calcium, iron, zinc, magnesium, and vitamin D, C, E, B.

In general, there are countless articles that have been published on this topic, as are the criteria referring to this sport-nutrition binomial () Mohamed *et al.,* 2022; Giménez-Monzó *et al.,* 2023; Díaz *et al.* (2023).

As has already been seen, there are very numerous examples, positions and suggestions that the aforementioned authors have provided regarding this topic; providing an answer to the enigma that always arises in matters like these. However, there are just a few proposals aimed at improving the nutrition of local athletes from an international activist movement. PPGarden is a clear example of this.

PPGarden by its acronym in English (Pretty and Productive) Garden consists of a proposal by activists linked to sports aimed at transforming idle areas into fertile and cultivable spaces, above all to guarantee young local athletes, fruits full of vitamins to their necessary nutrition. The movement was officially established on November 26, 2023 at the environment and sports workshop held in the context of the AFIDE Symposium, Havana Convention Center, Cuba (Figure 1).


***Fig. 1.*** *- Photo of the official PPGarden establishment, Cuba*

Designed primarily to mobilize environmental promoters within Inder (National Institute of Sports, Physical Education and Recreation) at the national level, the referred movement was conceived to organize coordinators in the 15 provinces, including the special municipality Isla de la Juventud and since its inception the group has been accompanied by the international Ecoflag movement of Japan.

This organization of sports professionals pursues the following objectives declared in the document that formalizes the commitment to collaborative work.

1. Influence human conscience and will to transform idle areas, not only institutional ones, but also forgotten ones, those that have become garbage deposits into cultivable areas to feed our people, especially for children and young athletes.

2. Strengthen the environmental education of our new generations in the love of the land and the biodiversity of the ecosystem.

3. Interweave methodologies, exchange knowledge and experiences with members of the movement inside and outside the country.

4. Strengthen the lines of the movement from the knowledge and use of science, promote informative and scientific publication as a result of the work carried out in the territories.

5. Exploit the best of social networks and the application of ICTs to organize, plan, execute and evaluate our work.

To date (January 8, 2024), work has been carried out on arable areas in different provinces of the country, highlighting the following: Pinar del Río, Havana, Ciego de Ávila, Villa Clara, Camagüey, Las Tunas, Santiago de Cuba and Guantanamo. It is important to recognize that the first seasonal Fair where fruits are delivered to young athletes was in the province of Guantánamo in January 2024. It is expected that in the near future the movement will cover most of the provinces of the Cuban nation and will incorporate other teams worldwide.

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The authors declare not to have any interest conflicts.

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The authors have participated in the writing of the work and analysis of the documents.