

NUTS AND PHYSICAL PERFORMANCE



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REFLECTIONS FROM THE CHAIR OF PHYSIOLOGY ON THE BEST SOCCER TEAM EVER

Focusing on consuming the best foods to fuel your training not only helps you feel better, but perform better. In this sense, scientific evidence emphasizes nuts as one of the most suitable foods for athletes, sportsmen and women, and trainers.

The availability of energy is essential for physical training. During endurance exercise carbohydrates and lipids constitute the main energy substrates for muscle metabolism, the relative contribution of each one being dependent on a variety of factors such exercise intensity and duration, as well as nutritional and training status.

Usually, athletes pay attention to their muscles; however, we must keep in mind that muscles "without brain" cannot fulfill their role, and the brain requires a continuous and adequate supply of glucose. Nuts contain a significant proportion of carbohydrates, with a concentration that ranges from about 15% for hazelnuts to about 20% for almonds. The intake of a reasonable amount of almonds shortly before a game or an athletic competition may be beneficial for mind clearness and well being sensation.

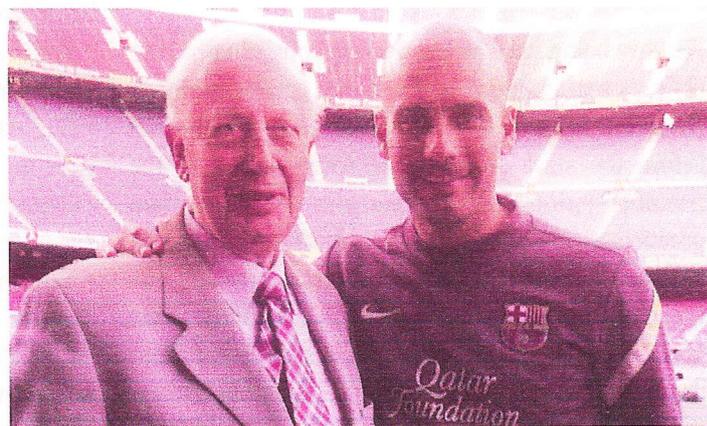
mitochondria -the structures that transform fat into "vital energy". Therefore, it is reasonable to think that this may apply to humans as well.

On the other hand, it has been shown that rats fed diets high in fat increase their intramuscular triglyceride or fat deposits which could potentially enhance the availability of fatty acids to the working muscles, especially during prolonged exercise. This suggestion is in part based on the fact that, in mild to moderate prolonged exercise, plasma fatty acid oxidation does not match estimates of total lipid oxidation; actually, in these circumstances, plasma fatty acid utilization can account for only about half of the total lipid oxidation.

All these studies reinforce the idea that the triglycerides contained in skeletal muscles may serve as a source of energy, quickly available, during the performance of moderated to prolonged strenuous exercise. It has been estimated that approximately 50% of the fat oxidized during exercise comes from these intramuscular triglyceride stores. Nuts become the ideal food for athletes because the main fatty acid that they contain is used (oxidized) faster than other fatty acids.

Scientific evidence has proved how nuts can be a good choice on fuelling a body for an athletic performance

In recent years, several research papers have provided evidence that an increased availability of fatty acids delay the appearance of exhaustion in animals and humans subjected to prolonged running. Furthermore, it has been shown in an animal model that increasing dietary fat intake can increase the number of



Prof. Segura and Pep Guardiola, former coach of FC Barcelona.

Nutrition is an essential part of athletes' life. Their daily choices about what and how much to eat directly impact sport performance, training and recovery.

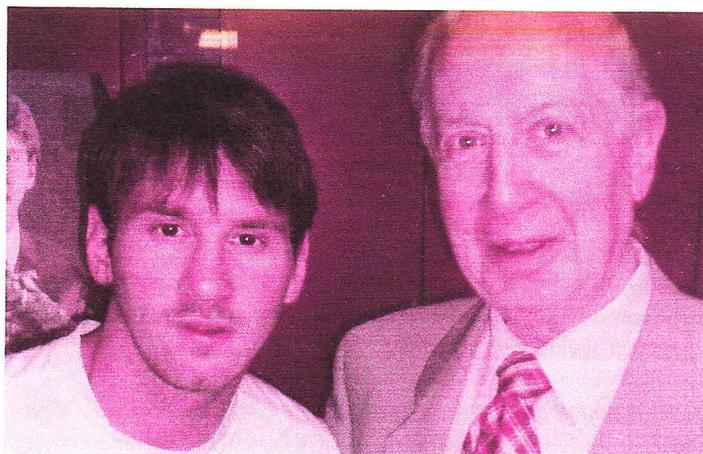
Nuts are one of the most beneficial snacks for any sportsman diet. Almonds have a macronutrient profile that can be very useful for athletes who are recovering from strenuous workout. A single ounce of almonds contains six grams of muscle feeding protein and six grams of replenishing carbohydrates; in addition, it contains a large amount of potential energy supply by fatty acids, which are of the healthy type (mainly oleic acid, a monounsaturated fatty acid); moreover, oleic acid may reduce the inflammation which is a common byproduct of hard training sessions.

Nuts: a complete food before, during and after training or competition.

In addition to training, the main determinant for a good performance is an adequate and fast recovery which should start as soon as possible after the match or the training session. Longer term recovery takes place during the 24 hours following the training or competition event and it should include nuts to ensure enough energy (carbohydrates, fat) and building material (protein), as well as micronutrients, to meet the requirements of

the athlete for optimal performance and good health.

- Nuts contain a relatively **high concentration of protein**, including **arginine** which plays an important role in our body: stimulates the immune system, reduces the healing time of injuries and is the precursor of nitric oxide -a potent regulator of the vascular system, and many more.
- Nuts contain also a **significantly amount of vitamins**, especially of the B group; a very important component of this group is **folic acid**, which plays an essential role in the formation of blood cells, and keeps the cardiovascular system in good shape. Folic acid is also necessary for the brain and contributes to a better cognition and mood.
- **Vitamin E** is of particular importance for sportsmen due to its antioxidant action that, together with ascorbic acid (or vitamin C) can help clean the free radical damage induced by the training stress.
- Nuts contain essential **minerals** which are needed to keep the metabolic processes in the mitochondria running smoothly. Magnesium in almonds, for instance, helps to carry the electric impulses needed for muscle contraction. On the other hand, nuts containing a remarkably low quantity of sodium.



Leo Messi, FC Barcelona player, and Prof. Segura.

Almonds and Sport

Almonds provide a wide range of nutrients that help keeping a healthy body for a good sporting performance: antioxidant vitamin E and healthy mono-unsaturated fatty acids -just to mention a couple of them.

We have being used a new strategy consisting in supplying a reasonable quantity of well ground almonds (between 20 to 30 grams) about 60 to 90 minutes before the start of the match/competition or the training session. In our experience with sportsmen practicing different modalities (football players, ski runners, Olympic marathon runners, ultra-long distance walkers, Olympic walkers...) all refer to have good "sensations", with better capability to maintain the rate of the run or the rhythm of the game, to overcome more easily the sensation of fatigue and have a faster and more complete recovery.

Suggestions to include almonds as part of recovery after training and/or competition

Snacks (for immediate recovery)

- Trail mix with roasted almonds
- Yoghurt with chopped almonds
- Homemade muesli with almonds and dried fruits

Breakfasts

- Breakfast cereal with chopped almonds and milk
- Yoghurt with berries and chopped almonds
- Bircher muesli with toasted almonds

Lunches

- Pasta with vegetables, pesto and toasted almond slivers
- Leftover chicken and almond stir fry with noodles
- Sandwich with lean meat and salad plus a small tin of almonds

Dinners

- Chicken salad sprinkled with toasted almonds
- Steak or chicken with stir fried vegetables with almonds
- Pasta with crumbs, chili and almonds
- Chicken and almonds with noodles