

Fewer supplements and more nourishment. More professionals and less professional intrusion

Menos suplementos y más alimentos. Más profesionales y menos intrusistas

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Sports medicine and related sciences are as old and determinative for athletes as the relationship between nutrition and health has been for the development of the human species. It is a science in continuous development which surprises us with its endless breakthroughs. However, and maybe for this very reason, it is the victim of an unprecedented and intolerable level of professional intrusion.

An interesting article was recently published which revealed that only 3% of British runners receive advice on nutrition from specialists, the rest resorting to the Internet, their coach, non-specialised magazines, friends and so on¹. This goes to show that, for athletes, both recreational and professional, the need to embrace supplements, functional foods, nutraceuticals, vitamins and so on is of the greatest importance, and, worse still, that the first thing that those starting physical activity in search of quality of life do is to buy all the professional paraphernalia, which, of course, includes a host of ergogenic aids.

It is difficult to know why they do this, but what we do know are the dire consequences in the medium and long term, and so we must continue to insist on the right strategy, which always involves turning to a professional. Nutritional supplements are necessary, but, as the law says, only in specific circumstances after diagnosis from professionals and under their supervision.

We now know that protein supplementation of 1.6 g/kg or less a day is enough to maximise the effects of training and facilitate muscle hypertrophy and recovery². Greater amounts do not increase the benefits, but they do open the door to negative effects in the short and medium term. This amount, 1.6 g/kg a day, is easy to reach by following a balanced diet varied in nutrients. We also know that high-protein diets and/or those involving carnitine supplements mean that carnitine is trimethylated by the intestinal microbiota and that this molecule, once absorbed and oxidised in the liver, promotes atheromatous plaques³. This should lead us to wonder whether many sudden deaths could result from supplements of this kind, which are as widespread as they are unnecessary.

The same occurs with supplements containing antioxidants. For years we attributed part of muscle fatigue to the unwelcome effect of oxygen radicals generated as a result of the metabolism when energy needs are increased in conjunction with the mechanical action associated with sarcomeric contraction⁴. Research in this direction justified recommending increased antioxidant intake through supplements. However, we now know that the premise was mistaken and that this solution may even be counterproductive. In the last ten years, several authors have shown that reactive oxygen and nitrogen species (ROS/NOS) *“are required in very low quantities, in physiological quantities, for genes key to the establishment of the phenotype of the healthy, high performance athlete to be expressed and that high doses block such effects”*⁵.

A decade ago, M. Ristow⁶ was one of the first researchers to demonstrate that oxidative stress induced by exercise improves insulin resistance and induces an adaptive response consisting of improved endogenous antioxidative capacity and that the supplementation of antioxidants, vitamin C (1,000 mg/day), plus vitamin E (400 IU/day) blocks these beneficial effects of exercise⁶. Therefore, diabetics who do specific exercise and take antioxidant supplements may not obtain the expected benefits. In recent years, the vast majority of double-blind intervention studies fail to show any potential health improvements associated with antioxidant supplementation⁷.

The current consensus in most laboratories working in this field is as simple as it is forceful: *“Adequate vitamin and mineral intake is recommended through a varied, balanced diet, which is still the best way to maintain an optimal antioxidant status during physical activity”*⁸.

The human body is designed to generate adaptive mechanisms that allow us to respond to physical effort more efficiently. Many of these have to do with the endogenous antioxidant machinery itself, which, paradoxically, requires small amounts of ROS⁹. Dr J. Vinas' group¹⁰ blazed a trail in this field with its article *“Exercise as an antioxidant: it up-regulates important enzymes for cell adaptations to exercise”*, in which they demonstrated the adaptive mechanisms through which exercise

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increases the quantity and activity of antioxidant enzymes. Recently, another antioxidant mechanism by which mitochondria generate less oxidative stress has been revealed. Mixed HIIT/SIT training leads to a greater formation of mitochondrial supercomplexes which are more efficient in generating the proton gradient, but produce less superoxide radical¹¹. All these mechanisms, especially the supercomplexes mechanism, are adversely affected by high doses of antioxidants through supplements^{12,13}.

These are two clear examples of current research marking a trend and reaffirming food rather than supplements in order to minimise errors. The best strategy is to let the body respond and adapt to extreme situations. Supplements, out of context, confuse response mechanisms and incite partial adaptations.

Therefore, the moral is to let the body respond with adaptations and not to interfere unnecessarily. We have to insist and continue to recommend “more nourishment and fewer supplements”.

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