

## IRON SUPPLEMENTATION IN SPORT ACTIVITY

### SUPLEMENTACIÓN CON HIERRO EN LA ACTIVIDAD FÍSICA

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#### IRON DEFICIENCY

Iron deficiency is the most common single nutrient disorder and represents a major public health problem worldwide<sup>1</sup>. Among the healthy population, with the exception of pregnant women, adolescents engaged in competitive endurance sports represent the group of subjects with the highest iron demand<sup>2</sup>. Indeed, the sport medical literature is rich of epidemiological studies evaluating the effects of iron deficiency on sport performances as well as the effects, positive or negative, induced by the martial supplementation. However, while the recommendation to pay particular attention in maintaining an adequate consumption of dietary iron would be always advisable, the use of iron supplements should be a careful choice based on a precise hematological evaluation, mainly because of the possible health risks deriving from an unjustified treatment. With particular regard to the sport related supplementation, currently no standardized guidelines for iron administration are available and the decision if administering or not oral iron in athletes is mainly based on empiric recommendations or on performance enhancing hopes. A more detailed analysis of the iron related issues may guide clinicians in a more scientifically based choice.

#### IRON METABOLISM

When the body has enough iron to meet its energy demand (functional iron), the remaining is stored in the bone marrow, liver and spleen as part of a precisely controlled system of iron metabolism<sup>3</sup>.

Humans maintain iron homeostasis mainly through the regulation of the intestinal iron absorption since the capacity to excrete iron is very limited. Systemic iron homeostasis including the absorption, the functional use and the storage is maintained by several well known molecules such as transferrin and ferritin. Recently, other key molecules such ceruloplasmin, the divalent metal ion transporter 1 (DMT1), hephaestin and hepcidin have been shown to play a significant role in the maintenance of the iron balance<sup>4,5</sup>.

Most adults have at least 3000 mg (45mg/Kg) of elemental iron in their bodies. Females generally have lower levels than males because of the iron loss during menses, pregnancy and lactation. Within that pool of total body iron, approximately two-thirds are contained in the heme (mostly incorporated in erythrocyte hemoglobin) and one-third in the storage forms

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