L-Carnitine
Nutritional therapy

EFFECT
L-Carnitine plays an essential role in converting fatty acids into metabolic energy. It is the only substance capable of transporting long-chain fatty acids across the inner mitochondrial membranes in the mitochondria, where they are burned (undergo beta oxidation). This is of particular importance in organs such as, for example, the heart, which are greatly dependent on beta oxidation and fat burning for their energy supply. Conversely, L-Carnitine transports the metabolic products from the citric acid cycle out of the mitochondrion and back into the cytoplasm. In people who use a lot of energy each day, such as during intensive physical work, sport, etc., L-Carnitine increases energy production in the muscle cells and it improves the oxygen uptake. It inhibits the formation and stimulates the removal of lactic acid and has an anti-fatigue effect in the event of a lack of oxygen in the tissues, amongst others as a result of lengthy physical work. L-Carnitine is also used when there is a lack of energy and fatigue on account of illness. However, acute exertion will result in an increased breakdown of L-Carnitine. Marathon runners excrete significantly increased amounts of L-Carnitine through perspiration and urine, which can deplete their own stores and delay recovery. In untrained individuals, L-Carnitine results in a significant improvement in performance, comparable to the effects of training. Conversely, training increases the L-Carnitine levels in the muscles.

Because sperm is also largely dependent on fat burning, L-Carnitine is also of significant importance for the quality of the sperm.

L-Carnitine is also involved in the production of energy from ketone bodies, pyruvate and/or amino acids (including the branched chain amino acids). It also has a protective effect against ammonia intoxication, because it stimulates the incorporation of ammonia in urea.

Because L-Carnitine is almost exclusively present in animal products, (carnis = meat), and a vegetarian diet is also often poor in the building blocks of L-Carnitine (lysine and methionine), deficiencies can arise in pure vegetarians.

For the past fifteen years, L-Carnitine has also been added to baby formulas, which again emphases the importance and the safety of this nutrient.

INDICATIONS
- chronic fatigue
- weakness
- anaerobism and lactate accumulation
- heart conditions (weakness, rhythm disorders)
- angina pectoris
- hypercholesterolemia
- hypertension
- intermittent claudication
- hepatic disorders
- renal disorders
- diabetes
- infertility (in men)
- obesity
- muscular dystrophy
- improvement in performance (including in sport)
- pregnancy and lactation period
- vegetarianism

CONTRA-INDICATIONS
At the recommended doses of L-Carnitine, no contra-indications are known. Intake during pregnancy does not result in any problems, and is in fact advisable because it contributes in various ways to the wellness of the mother and child.

SIDE EFFECTS
As far as is known, at the stipulated dose, L-Carnitine does not cause any adverse effects.

INTERACTIONS
A number of interactions are known of medicines containing L-Carnitine. A number of well-known anti-epileptics (for example phenobarbital, phenytoin, and carbamazepine) can significantly lower the L-Carnitine levels. Other interactions with mainstream or natural medicines are also possible. Consult an expert about this.
DOSAGE
Every day, take around 400 mg of L-Carnitine half an hour before the meal with water.

It is best not to take L-Carnitine at the same time as proteins, because the simultaneous presence of large amounts of other amino acids can impede the absorption of L-Carnitine. It is not advisable to take L-Carnitine in the evening, because the alertness and urge for activity that this can result in can potentially disturb the night's sleep. In relation to training or important matches, it is recommended that L-Carnitine is taken approximately two hours beforehand.

SYNERGISM
In addition to supplementation of deficiencies, for stimulating the body's own biosynthesis (particularly in the liver and kidneys) of L-Carnitine, it is advisable to also provide supplementation with the building blocks of L-Carnitine (the amino acids L-Lysine and L-Methionine), as well as with the co-factors in the synthesis (niacin, vitamin B6, vitamin C magnesium and iron). Apart from with the aforementioned nutrients, this need can best be met by a basic supplementation with a good multi and vitamin C.

REFERENCES