

YOGA FUEL™ FORMULATION

Holly A. Showalter, Ph.D.

Purdue University

Pharmacognosist and Scientific Consultant

HAS Scientific Consulting

A yoga dietary supplement product must meet the following requirements:

- Replenish the electrolytes lost during practice;
- Provide a source of energy for endurance so the student can get the most out of practice; and
- Be consistent with yoga beliefs and values.

Electrolytes are the minerals lost through sweat during yoga practice. These minerals – principally sodium, potassium, calcium and magnesium – are critical for the proper functioning of cells (Silverthorn, 3rd edition). Electrolytes are also required for the proper distribution of water, muscle contraction and expansion, blood pH, transmission of nerve impulses and heart rate. As you lose electrolytes through sweat, your body is susceptible to dehydration, cramping, nausea and dizziness and your body can lose its ability to perform.

An analysis of several leading electrolyte replacement drinks and supplements on the market identified two reoccurring problems. First, almost all do not adequately replace the amount of electrolytes lost through intense sweating and they do not have the electrolytes in the correct ratios to each other. Second, most energy drinks contain too much sugar (or other carbohydrates), which would not comply with the typical yoga student's dietary objectives.

Yoga Fuel™ needed a formulation that contained higher amounts of electrolytes, had no or limited carbohydrates and whose electrolytes were in the same ratio as a yoga student loses through sweat loss. To find a scientific ratio of sodium, potassium, calcium and magnesium, Sports Performance Labs, LLC turned to a peer-reviewed scientific study of sweat loss through exercise (Shirreffs, 1997). This research looked at human sweat loss induced in a hot, humid environment in healthy men and women. Yoga Fuel™ provides enough electrolytes in the correct ratio to help replenish those lost during practice – even in a hot and humid room.

An analysis of energy and stamina supplements found that most contained either carbohydrates, stimulants (such as caffeine) or both. To help provide energy and to be consistent with the values of yoga, Yoga Fuel™ utilizes the traditional medicines of India and China.

Yoga Fuel™ Hot Practice contains the natural products *Cordyceps sinensis* (Cordyceps) and *Withania somnifera* (L.) Dunal (Ashwagandha). Both are classified by modern herbalists as adaptogens – natural products that increase the body’s resistance to stress, exercise trauma, anxiety and fatigue. Both have properties that exert a normalizing influence on the body, neither over-stimulating nor inhibiting normal body function.

Cordyceps is a parasitic mushroom (technically an Ascomycetes fungus in the Clavicipitaceae family) that grows on lepidopteran larvae in the high altitudes of the Tibetan Plateau. The earliest written record of the healing effects of Cordyceps is in 620 A.D. during the Tang Dynasty. It has been used in Traditional Chinese Medicine (TCM) for thousands of years to promote overall good health and to increase energy and endurance (Holliday, 2004; Holliday, 2008).

Published Chinese scientific studies conducted in healthy elderly human patients claim a significant clinical improvement in chronic fatigue, cold intolerance, etc. vs. no improvement in the placebo groups (Zhou, 1998; Bao, 1994; Chamberlain 1996; Chen, 1995; Zhu, 2004). This is most likely due to increased ATP production and increased oxygen utilization (Zhou, 1998). Cordyceps first received publicity in the West with the performance of the Chinese Women’s Track Team in Stuttgart, Germany in 1993. Two little-known runners who had been using Cordyceps beat the world records for the 1,500-, 3,000- and 10,000-meter runs (World J., 1997).

Because of its remote locale, short growing season and difficulty in harvesting, traditional wild Cordyceps has, historically been one of the most expensive medicinal herbs in the world. In ancient China, its high price relegated it almost exclusively to the Emperor, his court and Chinese nobility. Though once reserved for the emperors of ancient China, it is now used around the world to increase energy and endurance. However, it is not always processed in a safe manner in Asia and adulteration and counterfeiting is common. Most cultivated Cordyceps grown at substantially lower altitudes has proven to be safer but is much less effective (Holliday, 2004). The Cordyceps in Yoga Fuel™ is cultivated in the U.S. using modern cultivation and biotechnology (Cleaver, U.S. Patent). It is four to five times more potent than wild Cordyceps (Holliday, 2004). The bioactive constituents consist of nucleosides and deoxynucleosides. The cultivated strain is derived from the Tibetan strain and grown in controlled environments that exactly replicate the natural growing conditions on the 18,000-foot Tibetan Plateau (50% less oxygen and temperatures just above freezing). The biochemical profile is the same as the wild Cordyceps (Holliday, 2004). However, contamination from heavy metals or other impurities/adulterants is not a concern due to the controlled manufacturing conditions. The natural product is authenticated by DNA verification and USDA-certified organic and vegetarian.

Yoga Fuel™ uses only the highest quality and safest Cordyceps available on the market today.

Ashwagandha has been used in Ayurveda (the traditional medicine of India) for more than 2,500 years. It is classified as a “rasayana” (restorative) herb and used to promote the body’s resistance to stress and to boost energy levels (Mukhopadhyaya, 2001; Weiner, 1994; and Archana, 1999). Ashwagandha is a shrub belonging to the same plant family as the tomato (Solanaceae), with both bearing yellow flowers and red fruit. It grows prolifically in India, Nepal and Pakistan. It is traditionally used to help strengthen the immune system, combat stress, increase energy and endurance (Mukhopadhyaya, 2001; Weiner, 1994; and Archana, 1999).

Yoga Fuel™ only uses what it believes to be the highest quality Ashwagandha. It is formulated with the patented Sensoril® ashwagandha standardized extract. The extract is standardized to withanolide glycoside conjugates and withaferin A, a withanolide that exists in a free form. In a double-blind, randomized, placebo-controlled, human dose response clinical trial, Sensoril® at 250 mg was shown to increase the body’s resistance to stress and boost energy levels (Auddy, 2008). The medium sized study had 98 human subjects and showed that 250 mg of Sensoril® extract significantly reduced fatigue, palpitations, and irritability in addition to other parameters vs. placebo as measured by the modified Hamilton anxiety-scale (mHAM-A) questionnaire. Mechanistically, the human study showed significant changes in serum cortisol and serum dihydroepiandrosterone sulfate (DHEAS) which are both biochemical variables involved with the hypothalamic-pituitary-adrenal axis and adaptogenic physiological effects (Auddy, 2008). C-reactive protein (CRP), a marker of chronic inflammation and associated with chronic stress was also significantly reduced vs. placebo in this study.

The B vitamins placed in the formula are also supportive of energy metabolism and are essential for humans. Vitamin B6 (pyridoxine HCl) is involved with red blood cellular growth, oxygen transport, synthesis of hemoglobin, protein metabolism and a deficiency can lead to anemia (Leklem, 1999). The Daily Value for B6 is 2 mg, but recent research indicates that more of this vitamin may be required by individuals who exercise intensely (Woolf, 2006). Nutrient status can be depleted by exercise in active individuals (Manore, 2000). Active individuals with vitamin deficiency can have their performance impaired (Williams, 1989). Yoga Fuel™ has been formulated with 5 mg of B6 per dose (250% of Daily Value) and the Institute of Medicine has established an upper tolerable limit of 100 mg per day for adults (Institute of Medicine, 1998).

Yoga Fuel™ is also formulated with 50 mcg of vitamin B12 (methylcobalamin) per dose. B12 is essential for proper red blood cell formation, DNA synthesis, and neurological function (Herbert, 1996; Herbert, 1994; Combs, 1992; Zittoun, 1999; Inst. of Med., 1998). The recommended daily allowance (RDA) for B12 in adults is 2.4 mcg. The IOM has not established an upper limit because of its low potential for toxicity. Vitamin B12 is only found naturally in animal derived products, so dietary intake can be problematic for strict vegetarians and vegans (Inst. of Med., 1998). Vitamin B12 metabolism can be altered in recreational athletes and endurance runners, potentially requiring higher dietary or supplementation intake (Herrmann, 2005; Singh, 1993). A randomized double-blind placebo- controlled crossover design study with vitamin B12 (included at 10 mcg), as part of an energy drink with caffeine and other ingredients

was shown to improve endurance performance in both female and male trained cyclists without a concomitant increase in “perceived exertion” (Ivy, 2009).

Açaí (*Euterpe oleacea*) and pomegranate (*Punica granatum*) fruits are now commonly referred to as “superfruits” due to their antioxidant and health promoting properties (Jensen, 2008; Seeram, 2008a and b). Yoga Fuel™ contains organic açaí fruit powder grown in the Brazilian rainforest. In a randomized double-blind placebo-controlled study of 12 healthy humans, a drink product containing açaí as the main ingredient reported a significant increase in serum antioxidant level (at hrs 1 and 2) and a decrease in lipid peroxidation (at hr 2) post-consumption (Jensen, 2008). This study also had *in vitro* human blood data to show that it did reduce reactive oxygen species (ROS). One study claims that açaí is the highest activity food ever reported in the ORAC (oxygen radical absorbance capacity) assay (Schauss, 2006). A comprehensive antioxidant study that evaluated a variety of different fruit juice activities *in vitro* showed that pomegranate juice was the best overall antioxidant (Seeram, 2008b). Four different antioxidant tests were measured along with antioxidant functionality tests to show that there was at least a 20% greater antioxidant potency composite index with pomegranate juice.

Yoga Fuel™ is specially formulated with the combination of Cordyceps and Ashwagandha to help provide the yoga student with the strength and stamina needed for the most demanding practice. Current Western research on electrolytes for proper muscle function was considered along with the ancient Eastern herbs for energy and endurance. B vitamins and superfruits were added to help support the entire formula from an antioxidant and healthy cellular support perspective.

Proper hydration is very important during and after intense exercise and the yoga student will need to achieve proper hydration following the use of this formula and any exercise regimen.

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