

## CHAPTER 5

### CONCLUSION AND RECOMMENDATIONS

The primary aim of the study was to determine the efficacy of both Cellfood® and Switch™ as ergogenic aids for endurance athletes. In order to reach this goal a pre-test – post-test, double-blind cross-over, placebo controlled experimental design, was adopted for the study. Accordingly subjects were randomly assigned to either a placebo, Cellfood® or Switch™ group.

Each of the groups underwent a supplementation period comprising three four-week cycles of varying dosages, as recommended by the manufacturer. After each cycle the subjects stopped supplementation during a two-week washout period, prior to crossing over to an alternative supplementation and dosage cycle.

Accordingly the groups were arranged as follows over the duration of the study:

<b>Cycle 1</b>		
<b>Group</b>	<b>Product</b>	<b>Dosage</b>
<b>A</b>	Placebo	28ml
<b>B</b>	Cellfood®	28ml
<b>C</b>	Switch™	53.2ml
<b>Cycle 2</b>		
<b>Group</b>	<b>Product</b>	<b>Dosage</b>
<b>A</b>	Cellfood®	39.2ml
<b>B</b>	Switch™	78.4ml
<b>C</b>	Placebo	39.2ml
<b>Cycle 3</b>		
<b>Group</b>	<b>Product</b>	<b>Dosage</b>
<b>A</b>	Switch™	91.7ml
<b>B</b>	Placebo	44.8ml
<b>C</b>	Cellfood®	44.8ml

Cellfood® is a proprietary super energized complex concentrate held in colloidal suspension. It is ingested orally in the form of fluid droplets added to water. It contains 78 trace elements and minerals, combined with 34 enzymes, 17 amino acids, dissolved and nascent oxygen, suspended in a solution of deuterium sulphate ( $D_2SO_4$ ). Cellfood® is unique due to its ability to create nascent oxygen or “newly born” oxygen (Latin- Nascere). In biochemical terms nascent oxygen refers to this newly born single oxygen (elemental oxygen) that has not yet entered into biochemical reaction. Nascent oxygen is negatively charged ( $O^-$ ) Free radicals on the other hand are positively charged ions of single oxygen ( $O^+$ ). The opposite charge of these ions cause them to attract each other, forming a single pure oxygen molecule ( $O_2$ ). Nascent oxygen “seeks out” and neutralizes dangerous free radicals, combining to form pure oxygen in the process.

Switch™ consists of the same ingredients as those found in Cellfood® but with two added substances mainly aimed at the mobilization of fat as energy source . The first substance being Citrin K and the second being L-Carnitine. Citrin-K is a herbal extract from the Garcinia Cambogia fruit plant and contributes 25% to the total Switch™ make up. L-Carnitine is a nutrient produced naturally in the liver and contributes 20% to the total Switch™ make up. A 100ml bottle of Switch™ contains about two months supply at 20 drops per serving. Each of these servings contains: 250mg Cellfood® proprietary blend; 110mg Citrin K; and 90mg L- Carnitine.

Cellfood® and Switch™ are liquid concentrates, taken by mixing a number of drops in a quarter of a glass of distilled or filtered water. Due to the oral ingestion of these aids one would have to classify them as nutritional aids, with hyper-oxygenation of the cellular environment as their proposed ergogenic mechanism of action.

The following dependent variables were measured:

- Haematology:
  - Ferretin values
  - Haemoglobin
  - Red blood cell count
  - Hematocrit
  - Fasting glucose
  
- Pulse oximetry
- Rate of perceived exertion
- Heart rate
- Capillary blood lactate concentrations
- Oxygen utilization and related spirometry:
  - RER
  - $VC_{O_2}$
  - $VE/VC_{O_2}$
  - $etCO_2$
  - $VE/V_{O_2}$
  - $etO_2$
  - VE
  - VT
  - RR
  - $V_{O_2}$  max (Absolute)
  - $V_{O_2}$  max (Relative)

## 5.1 SPECIFIC RECOMMENDATIONS FOR PRACTICE

Based on the results of this study, endurance athletes who use Cellfood® or Switch™ with the aim of receiving an ergogenic effect should note that, when considering the efficacy of the products across all dosages:

### **Cellfood® vs. Placebo**

Placebo was significantly ( $p < 0.05$ ) more effective than Cellfood® in the following variables measured:

- Haemoglobin concentration (first cycle, low dosage)
- Hematocrit (first cycle, low dosage)
- Haemoglobin saturation at 17km/h (third cycle, high dosage)
- Heart rate at 10km/h (third cycle, high dosage)

Cellfood® was no more effective ( $p > 0.05$ ) than placebo in the following variables measured:

- Red Blood Cell count
- RER
- VE
- $VCO_2$
- Absolute  $V_{O_2max}$
- Relative  $V_{O_2max}$

Cellfood® tended to be more effective than placebo, but not significantly so ( $p > 0.05$ ), in the following variables measured:

- Ferretin
- Glucose
- Pulse Oximetry
- RPE
- Heart Rate
- Lactate
- $VE/VCO_2$
- $etCO_2$
- $VE/V_{O_2}$
- $etO_2$
- VT
- RR

Cellfood® was only significantly ( $p < 0.05$ ) more effective than placebo in the following variables measured during the following cycles:

- Haemoglobin (second cycle, intermediate dosage)
- Hematocrit (second cycle, intermediate dosage)

**Switch™ vs. Placebo**

Placebo was significantly ( $p < 0.05$ ) more effective than Switch™ in the following variables measured:

- Hemoglobin saturation at 17km/h (third cycle, high dosage)
- Heart rate at 10km/h (third cycle, high dosage)

Switch™ was no more effective ( $p > 0.05$ ) than placebo in the following variables measured:

- Ferretin
- $etCO_2$
- VE
- VT
- Absolute  $V_{O_2max}$

Switch™ tended to be more effective than placebo, but not significantly so ( $p > 0.05$ ), in the following variables measured:

- Glucose
- Pulse Oximetry
- RPE
- Heart Rate
- Lactate
- RER
- $VC_{O_2}$
- $VE/VC_{O_2}$

- VE/V<sub>O<sub>2</sub></sub>
- et<sub>O<sub>2</sub></sub>
- RR
- Relative V<sub>O<sub>2</sub></sub>max

Switch™ was only significantly ( $p < 0.05$ ) more effective than placebo in the following variables measured during the following cycles:

- Haemoglobin (first cycle, low dosage)
- Red Blood Cell Count (first cycle, low dosage)
- Hematocrit (first cycle, low dosage)

#### **Cellfood® vs. Switch™**

The only significant ( $p < 0.05$ ) differences between Cellfood™ and Switch™ were as follows:

- Cellfood® was significantly ( $p < 0.05$ ) more effective in increasing haemoglobin concentration than Switch™ during the second cycle at an intermediate dosage.
- Cellfood® was significantly ( $p < 0.05$ ) more effective in increasing hematocrit than Switch™ during the second cycle at an intermediate dosage.
- Cellfood® was significantly ( $p < 0.05$ ) more effective in increasing haemoglobin saturation at 17km/h than Switch™ during the third cycle at a high dosage.
- Cellfood® was significantly ( $p < 0.05$ ) more effective in decreasing heart rate at 10km/h than Switch™ during the third cycle at a high dosage.
- Switch™ was significantly ( $p < 0.05$ ) more effective in increasing red blood cell count than Cellfood® during the first cycle at a low dosage.
- Switch™ was significantly ( $p < 0.05$ ) more effective in increasing hematocrit than Cellfood® during the first cycle at a low dosage.

- Switch™ was significantly ( $p < 0.05$ ) more effective in increasing haemoglobin concentration than Cellfood® during the first cycle at a low dosage.

In conclusion there are two notable observations to be made which may be considered limitations to the findings of this study. The treadmill testing protocol used during the study generally lasts maximally up to 20 minutes, depending on the fitness and potential of the athlete. A sub-maximal test protocol, of greater duration, with fat stores being the predominant energy source, could have provided a superior result for Switch™ due to it containing L-Carnitine and Citrin K, which aid in the mobilization of fat as energy source. In retrospect it appears as if the two-week wash-out period between cycles may not have been sufficient to negate the benefits experienced during the supplementation with the products. The possibility of a carry-over benefit of the preceding product to the subsequent cycle was a possibility. This may have unfounded some of the comparative between-group analyses.

## 5.2 FUTURE RESEARCH DIRECTIONS

Further research evaluating the efficacy of Cellfood® and Switch™ would be prudent in the following contexts:

- Pre-tests to confirm base-line values at the start of each new cycle;
- Wash-out periods of at least four weeks to ensure no carry-over benefits of subsequent products;
- Acute effects of Cellfood® and Switch™ on the performance of the endurance athlete;
- Possible advantages of Cellfood® and Switch™ for the anaerobic athlete;
- Dosage response of Cellfood® and Switch™ according to bodyweight.
- Determination of an upper “threshold” dosage, where-after the beneficial effects of these supplements may decline.
- Increased fat store utilization through the use of Switch™.