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Efficacy of Cellfood® and Switch™ as Ergogenic Aids in Endurance Athletes

DEBIC & PLAN

This dissertation is submitted in partial fulfillment of the requirements for the degree of

by

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DEDICATION

This dissertation is dedicated to my wife, Kim

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SYNOPSIS

TITLE	: Efficacy of Cellfood® and Switch™ as Ergogenic Aids in Endurance Athletes
CANDIDATE	: H.W. Nolte
SUPERVISOR	: Dr. H.J. van Heerden
DEGREE	: M.A. (HMS)

The efficacy of Cellfood® and Switch™ as ergogenic aids for endurance runners was evaluated using a pre-test – post-test, double-blind cross-over, placebo controlled experimental design. Thirty marathon runners (19 males and 11 females) between the ages of 20-51 years (mean age = 38.4 ± 8.2 years), who could maintain a minimum running pace of 7.5 minutes per km, volunteered to take part in the study. Subjects were randomly assigned to either a placebo (n = 10), Cellfood® (n = 10) or Switch™ (n = 10) 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.

In an analysis of significant changes ($p < 0.05$) from baseline values within groups across the three cycles, Switch™ showed an ergogenic increases in red blood cell count (7.8%) and hematocrit (6.2%) during the first (low-dosage) cycle. Cellfood® showed a potentially ergolytic increase of 6.9% in lactate accumulation at 14 km/h treadmill speed during the second (intermediate-dosage) cycle. Switch™ showed an ergogenic decrease in lactate accumulation of 17.2% at 14 km/h during the third (high-dosage) cycle. Cellfood® showed an ergogenic decrease of 4% in VE/V_{O_2} during the first cycle, while Switch™ showed a similar decrease of 4.5% during the second cycle. During the third cycle Cellfood® showed an ergogenic increase of 5% in absolute V_{O_2max} . In an analysis of significant differences ($p < 0.05$) in changes between groups, across the three cycles, Switch™ showed an increase (5.7%) in haemoglobin (Hb) concentration after the first cycle, which differed significantly from an inverse decrease in Cellfood® (6.8%). During cycle two, Cellfood® showed an increase of 3.2% in haemoglobin concentration, which differed significantly from an

inverse decrease in Switch™ (3.3%). During the first cycle, Switch™ showed an increase in red blood cell count of 7.8%, which differed significantly from an inverse decrease of 1.2% in Cellfood®. The increase in hematocrit (6.2%) observed with Switch™ during cycle one, differed significantly from an inverse decrease of 11.8% observed in Cellfood®. During the second cycle, a reverse tendency was found in hematocrit, with Cellfood® showing an increase of 3.0%, which differed significantly from a decrease of 7.7% in Switch™. In the third cycle, Switch™ showed a potentially ergolytic decrease of 2.2% in haemoglobin saturation at 17 km/h, which differed significantly from an unchanged concentration in Cellfood®. During the third cycle, Cellfood® showed a significantly greater ergogenic decrease of 4.5% in heart rate at 10km/h, as compared to the corresponding 0.3% reduction observed in Switch™.

In conclusion, when considering the relative efficacy of the two products with respect to potential ergogenic benefits throughout any of the cycles, Cellfood® (at the highest dosage) was the most superior, followed by Switch™ (at the lowest dosage), with both products either matching or being superior to placebo in any of the dosage cycles.

KEY WORDS

Cellfood®; Switch™; Haemoglobin Concentration and Saturation; Hematocrit; Heart Rate; Blood Lactate Concentration; VE/V_{O_2} ; Absolute V_{O_2max} .



SINOPSIS

TITEL	: Doeltreffendheid van Cellfood® en Switch™ as Ergogeniese Middels vir Uithouvermoë Atlete
KANDIDAAT	: H.W. Nolte
STUDIELEIER	: Dr. H.J. van Heerden
GRAAD	: M.A. (MBK)

Die doeltreffendheid van Cellfood® en Switch™ as ergogeniese middels vir uithouvermoë atlete is ondersoek. 'n Voor-toets – na-toets, dubbel-blind oorkruis, plasebo beheerde eksperimentele ontwerp is vir die doel aangewend. Dertig maraton atlete (19 manlik en 11 vroulik) tussen die ouderdomme van 20 en 51 (gemiddelde ouderdom = 38.4 ± 8.2 jaar), wie 'n minimum hardloopspoed van 7.5 minute per kilometer kon handhaaf, het vrywillig aan die studie deelgeneem. Die proefpersone is lukraak na 'n plasebo ($n = 10$), Cellfood® ($n = 10$) of Switch™ groep ($n = 10$) toegewys. Elkeen van die groepe het 'n aanvullingstydperk van drie, vier-week siklusse met verskillende doserings, soos deur die vervaardigers aanbeveel, deurgemaak. Na die afloop van elke siklus het proefpersone die aanvullings vir 'n twee-week uitwas tydperk gestaak, waarna hulle met die volgende produk en dosis siklus begin het.

Met ontleding van beduidende veranderinge ($p < 0.05$) tussen die voor- en na-toets waardes binne die groepe, oor die drie verskillende siklusse, het Switch™ 'n ergogeniese verhoging in rooi bloedseltelling (7.8%) en hematokrit (6.2%) na die eerste siklus (lae-dosering) getoon. Cellfood® het 'n potensiele ergolitiese toename van 6.9% in laktaat akkumulاسie teen 14km/h tydens die tweede siklus (middel dosering) getoon. Switch™ het 'n ergogeniese afname van 17.2% in laktaat akkumulاسie getoon teen 14km/h gedurende die derde siklus (hoë-dosering). Cellfood® het 'n ergogeniese afname van 4.0% in VE/V_{O_2} getoon tydens die eerste siklus terwyl Switch™ 'n soortgelyke afname van 4.5% getoon het tydens die tweede siklus. Tydens die derde siklus het Cellfood® 'n ergogeniese toename van 5% getoon in absolute V_{O_2} maks.



Met ontleding van beduidende verskille ($p < 0.05$) in veranderings tussen groepe, oor die drie verskillende siklusse, het Switch™, tydens die eerste siklus 'n toename van (7.5%) in hemoglobien konsentrasie getoon wat beduidend verskil het van 'n omgekeerde afname in Cellfood® (6.8%). Tydens die tweede siklus het Cellfood® 'n toename van 3.2% in hemoglobien konsentrasie getoon, wat beduidend verskil het van 'n omgekeerde afname in Switch™ (3.3%). Tydens die eerste siklus het Switch™ 'n toename van 7.8% in rooibloedsel telling getoon wat beduidend verskil het van 'n omgekeerde afname van 1.2% in Cellfood®. Die toename in hematokrit (6.2%) in Switch™ tydens die eerste siklus, het beduidend verskil van 'n omgekeerde afname van 11.8% in Cellfood®. Tydens die tweede siklus was daar 'n omgekeerde tendens in die hematokrit waardes, met Cellfood® wat 'n toename van 3.0% getoon het wat beduidend verskil het van 'n afname van 7.7% in Switch™. Tydens die derde siklus het Switch™ 'n potensiele ergolitiese afname van 2.2% in hemoglobien versadiging getoon teen 17km/h. Hierdie afname het beduidend verskil van 'n onveranderde versadiging in Cellfood®. Tydens die derde siklus het Cellfood® 'n beduidend groter ergogeniese afname van 4.5% in harttempo getoon teen 10km/h teenoor die 0.3% afname wat in Switch™ waargeneem.

Wanneer die relatiewe doeltreffendheid van die twee produkte as ergogeniese middels deur alle siklusse samevattend in ag geneem word, was Cellfood® (teen die hoogste dosering) die mees doeltreffend, gevolg deur Switch™ (teen die laagste dosering), terwyl beide produkte tydens enige van die siklusse ten minste die gelyke of meer doeltreffend was as die plasebo.

SLEUTELWOORDE

Cellfood®; Switch™; Hemoglobien Konsentrasie en Versadiging; Hematokrit; Harttempo; Bloed Laktaat Konsentrasie; VE/V_{O_2} ; Absolute V_{O_2} maks.



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