

### Capsimax Increases Resting Energy Expenditure in Males Under Fasting State: A Randomized, Double-Blind, Placebo Controlled, Cross-Over Study

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**Objectives:** Obesity is caused by an imbalance between energy intake and energy expenditure. Resting energy expenditure (REE) represents the calories burned at rest and accounts for > 60% of total energy expenditure. Energy expenditure plays an important role in obesity development, hence an increase in REE could facilitate body weight reduction. Capsaicinoids, extracted from capsicum annum have been known to increase metabolism, lipolysis & induce satiety. The study objective was to evaluate the effects of Capsimax™ on REE and thermal sensation.

**Methods:** This was a randomized, double-blind, placebo controlled, cross-over study. Efficacy analysis included subsets of 17 males and 7 females who received single dose of Capsimax™ 100 mg (2 mg total capsaicinoids) and placebo in a cross-over fashion with washout period of 3–6 days as per randomization schedule. REE was measured using Cosmed Q-NRG by

indirect calorimetry. Secondary objectives were Area under curve (AUC) for REE, VO<sub>2</sub>, VCO<sub>2</sub> & subject's innate thermal sensation using American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) scale. REE, VO<sub>2</sub>, VCO<sub>2</sub>, ASHRAE scale were evaluated at 0 (pre-dose), 1, 2, 3 & 4 hours and additional measures for ASHRAE scale at 0.5 & 1.5 hours post-dose. Safety was assessed throughout the study with measurements of ECG, blood pressure, pulse rate, body temperature & adverse event occurrences.

**Results:** In males, Capsimax™ consumption significantly increased ( $p < 0.05$ ) the change in REE at 1 hr ( $+90.19 \pm 36.99$  kcal Vs  $-92.97 \pm 35.95$  kcal), 2 hr ( $+77.17 \pm 35.12$  kcal Vs  $-41.90 \pm 35.12$  kcal), 3 hr ( $+48.47 \pm 38.60$  kcal Vs  $-51.74 \pm 37.69$  kcal) & 4 hr ( $+30.17 \pm 40.37$  kcal Vs  $-43.88 \pm 40.37$  kcal) as compared to placebo. Significant differences ( $p < 0.05$ ) were also seen for AUC<sub>0–2</sub> REE, VO<sub>2</sub> at 1, 2 & 3 hrs and VCO<sub>2</sub> at 3 hrs for Capsimax™ versus placebo. Although not significantly different, subject's in Capsimax™ group showed higher feelings of warmth at all time points post dose based on ASHRAE score versus placebo. No significant differences were observed for any of the endpoints in females. No safety issues or adverse events were seen.

**Conclusions:** Our study findings demonstrate that Capsimax™ supplementation increases REE in males and may represent a useful nutritional strategy to help weight management efforts.

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