

# Dietary Supplement Combination Reduces CRP Levels and Improves Mood State in Stressed Subjects



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# Background

- The prevalence of chronic stress (enough stress to exert a detrimental health effect) is variously estimated with prevalence between 65% and 90% of the American adult population:
  - American Psychological Association (65%)
  - U.S. Centers for Disease Control and Prevention (70%-80%)
  - World Health Organization (75-80%)
  - American Institute for Stress (90%)



# Chronic Stress

- Major role in the pathophysiology of many disease states.
- Vigor is defined as a 3-tiered sustained mood-state that is characterized by (1) physical energy, (2) mental focus, and (3) cognitive liveliness.
  - Vigor can also be described as the opposite of "Burnout" (physical fatigue, mental exhaustion, cognitive weariness).
- Stress-related changes in psychology may be due to both endocrine and behavioral factors – and may be mediated or attenuated by lifestyle factors including diet, exercise, and dietary supplements.



# Metabolic Hormone Balance & Mood

- In both men and women, a rise in cortisol exposure and/or a drop in testosterone leads to fatigue, a loss of sex drive, and abdominal obesity.
- Some of the most common effects of imbalanced cortisol/testosterone ratio (elevated cortisol with low testosterone) include (in both men and women):
  - Emotional changes (increased Fatigue and Depression)
  - Low sex drive
  - Decreased muscle mass
  - Reduced metabolic rate
  - Increased abdominal fat



# Purpose of Research

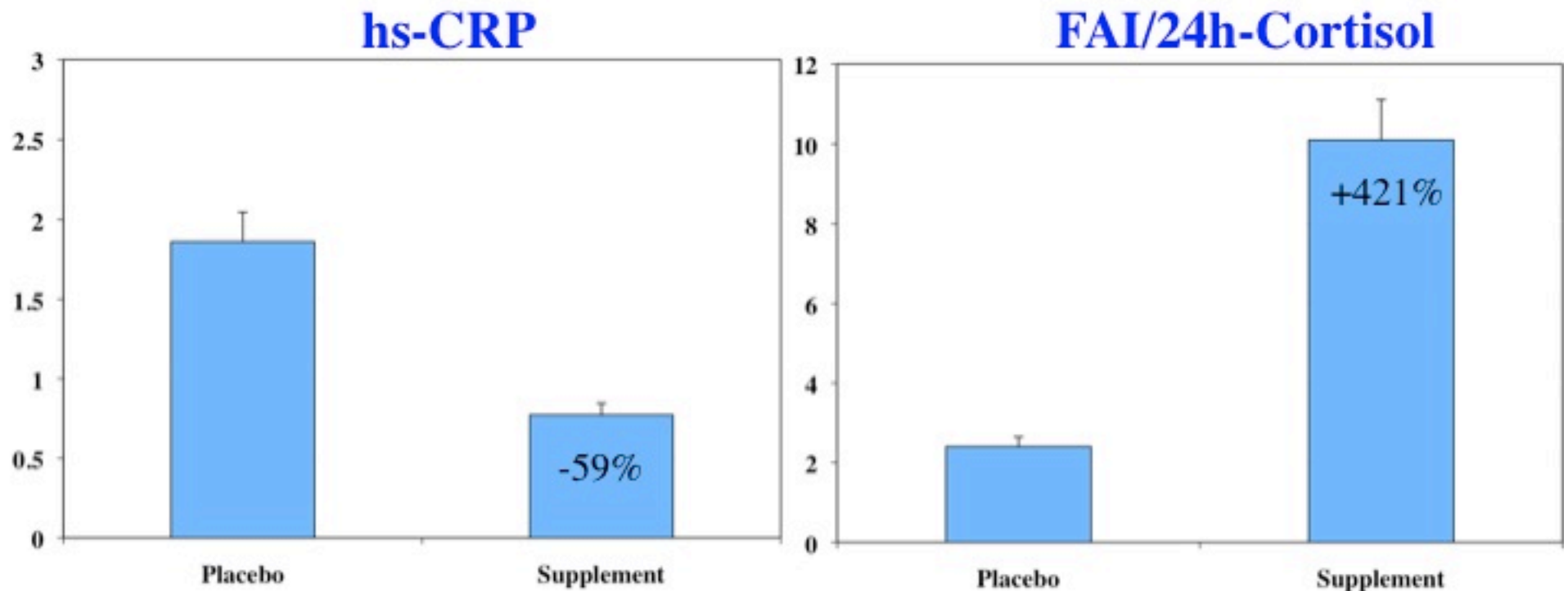
- To examine the effect of two dietary supplements on measures of Metabolic Balance, CRP Levels, and Psychological Mood State (Vigor & Tension)
- We investigated two commercially-available dietary supplements:
  - XanGo (*Garcinia mangostana*) Juice
    - (previously shown to reduce CRP levels)
  - Eleviv (*Citrus sinensis*, *Eurycoma longifolia*, *Camellia sinensis*, Theanine)
    - (previously shown to restore Metabolic Balance and improve Mood State)

# METHODS

- Subjects were 30 men (N=8) and women (N=22) pre-screened for “moderate” levels of psychological stress
  - Chronic stress is known to disrupt metabolic balance, increase inflammation, and reduce mood/vigor
- Subjects were randomized to receive BOTH supplements daily for 4 weeks in placebo-controlled, double-blind fashion.
  - XanGo Juice = 3 ounces in AM & 3 ounces in PM
  - Eleviv herbal capsules = 2 capsules in AM
- Blood/Urine/Saliva samples were assayed for (Genova Diagnostics):
  - **Reproductive Hormones** (Progesterone, Estradiol, Estriol, Estrone, 2-hydroxyestrone, 16-alpha-hydroxysterone, Estrone sulfate)
  - **Highly sensitive C-Reactive Protein** (hsCRP)
  - **Metabolic Balance** (ratio between “Free Androgen Index” and “24-hour Cortisol Exposure”)
  - **Profile of Mood States** (POMS – Vigor & Tension)
- Paired Student’s *t*-tests were used to assess differences between between pre/post measures. Data are expressed as mean  $\pm$  SD.

# RESULTS (week 4)

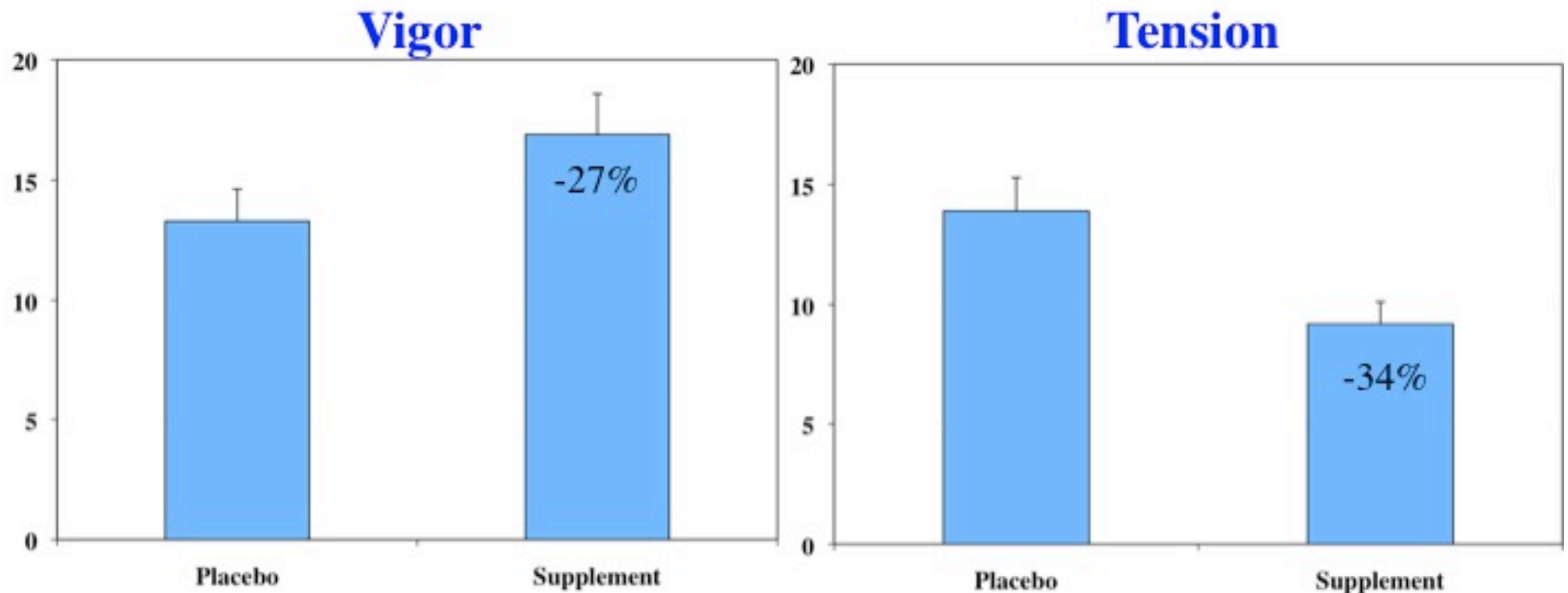
## CRP Levels & Metabolic Balance



Both,  $p \leq 0.05$  compared to Placebo

# RESULTS (week 4)

## Profile of Mood States (POMS)



Both,  $p \leq 0.05$  compared to Placebo

# Conclusions

- Chronic stress can disrupt Metabolic Balance, Inflammatory Balance, and Mood State (Vigor/Tension)
- Restoration of Metabolic Balance and Inflammatory Balance are associated with improved Mood State
- Each of these parameters may be linked with superior long-term health and well-being



**Thank You**

