PSYCHOLOGICAL VIGOR IS ASSOCIATED WITH STRESS HORMONE PROFILE

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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%)

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Chronic Stress

- Major role in the pathophysiology of many disease states, particularly psychological disorders including depression, chronic fatigue syndrome, anxiety, fibromyalgia, and burnout.
- 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).
- These 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.

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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
  - Weak bones
  - Back pain
  - Elevated cholesterol

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Purpose of Research Series

- To examine the role of various forms of chronic stress on metabolic hormone balance and psychological mood state in moderately stressed subjects.

- We investigated several forms of chronic stress:
  - Exercise and Sleep Deprivation (endurance cyclists)
  - Everyday Psychological Stress ("stress eaters" during the Holiday period from Thanksgiving to New Year's Day)
  - Dieting Stress (overweight subjects)

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Exercise Stress - METHODS

- We used a water-soluble extract of *Eurycoma longifolia*, standardized to 22% eurypeptides and 40% glycosaponins.
- Subjects received 4 doses of *Eurycoma* extract (100mg, N=15) or look-alike placebo (N=15) approximately 30 minutes prior to endurance exercise.
- Male subjects (N=30) were recruited from among participants in a 24-hour mountain bike event.
- Subjects provided a saliva sample before and after each of 4 laps (14.91 miles per lap) = 8 saliva samples.
- Paired Student's *t*-tests were used to assess differences between between groups in 24h exposure to testosterone and cortisol. Data are expressed as mean $\pm$ SD.

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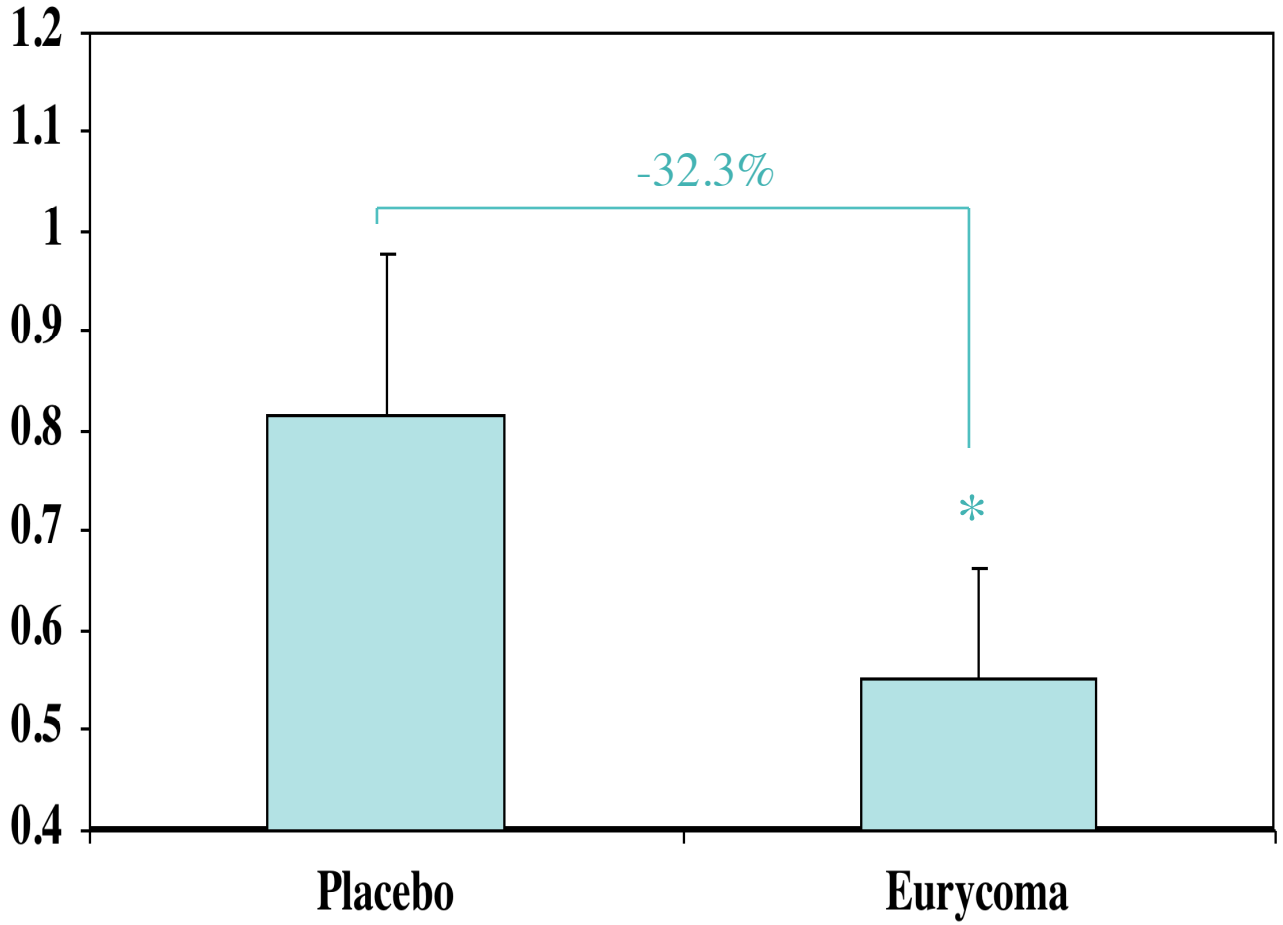
Exercise Stress - RESULTS

Salivary Cortisol (ug/dL)



*p ≤ 0.05 compared to Placebo

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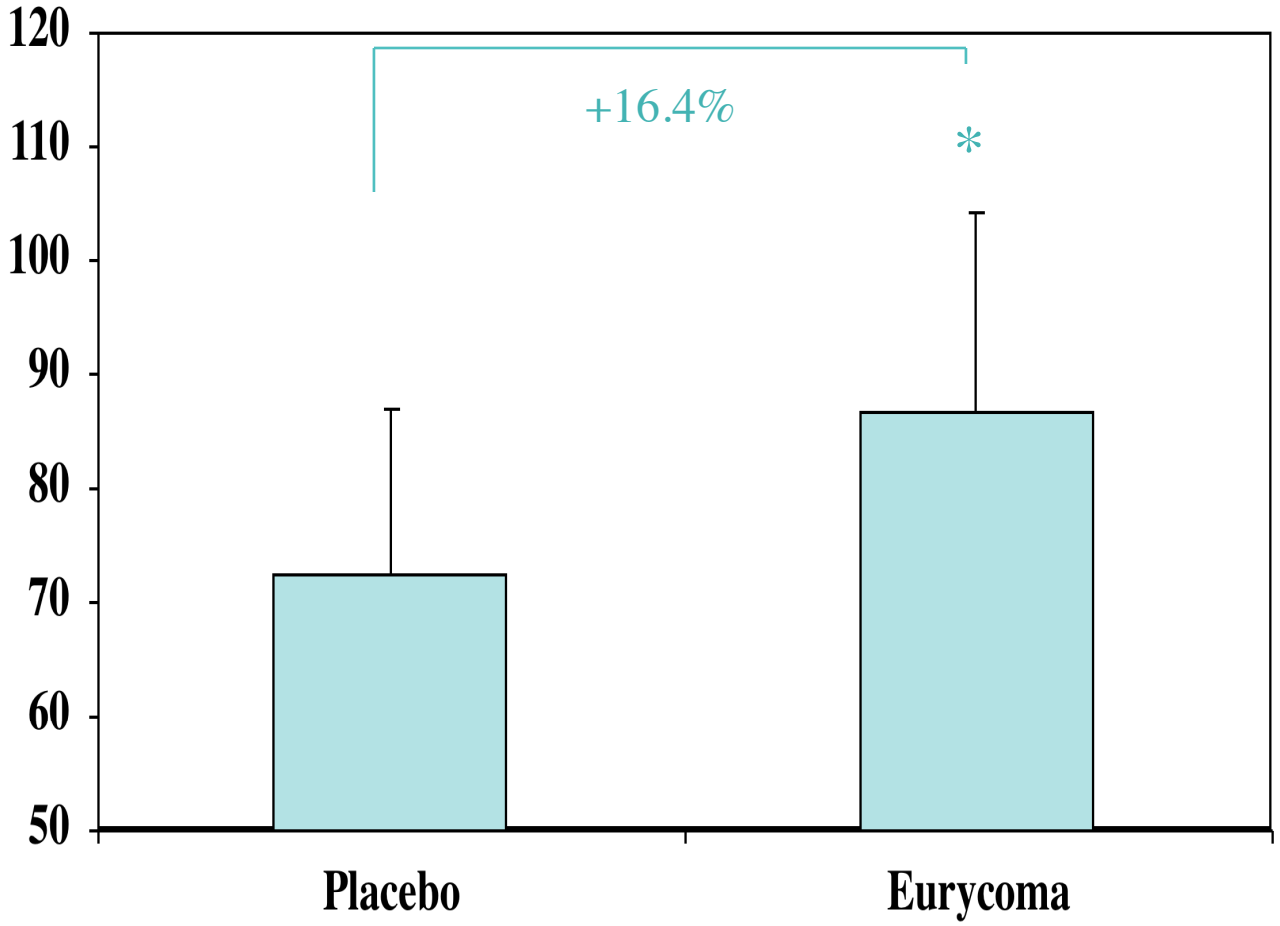
Exercise Stress - RESULTS

Salivary Testosterone (pg/dL)



*p ≤ 0.05 compared to Placebo

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Exercise Stress - CONCLUSIONS

- *Eurycoma longiofolia* extract may help to maintain normal levels of cortisol (low) and testosterone (high) and thus promote an overall "anabolic" hormonal state - versus a "catabolic" state characterized by elevated cortisol and suppressed testosterone during intense endurance exercise.

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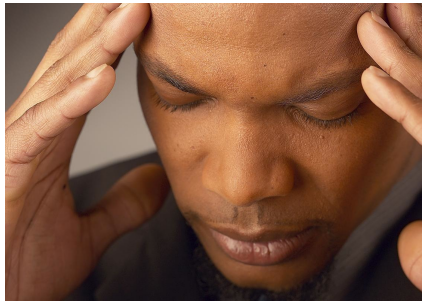
Holiday Stress - BACKGROUND

- The literature strongly suggests that stress/cortisol exposure is associated with increased appetite, weight gain, and specifically with increased abdominal adiposity[1-3]
- The literature also suggests that weight gain is significant[4-6] and weight loss difficult[7-9] during the 6-week holiday period
- Women with high cortisol response (compared to low responders):
    - consumed more calories
    - ate significantly more sweet foods
    - had more negative moods
- High dietary restraint is associated with high urinary cortisol excretion
    - Dietary Restraint = Consciously trying to limit food intake to achieve or maintain a desired body weight



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Holiday Stress - PURPOSE

- We conducted an 8-week lifestyle program to evaluate effects on measures of stress/mood, cortisol, body weight, and body composition
- Subjects were self-identified as "high stress" with historical holiday weight gain (5-10lbs by self-report)
- Program was conducted from week prior to Thanksgiving to week after New Year's Day

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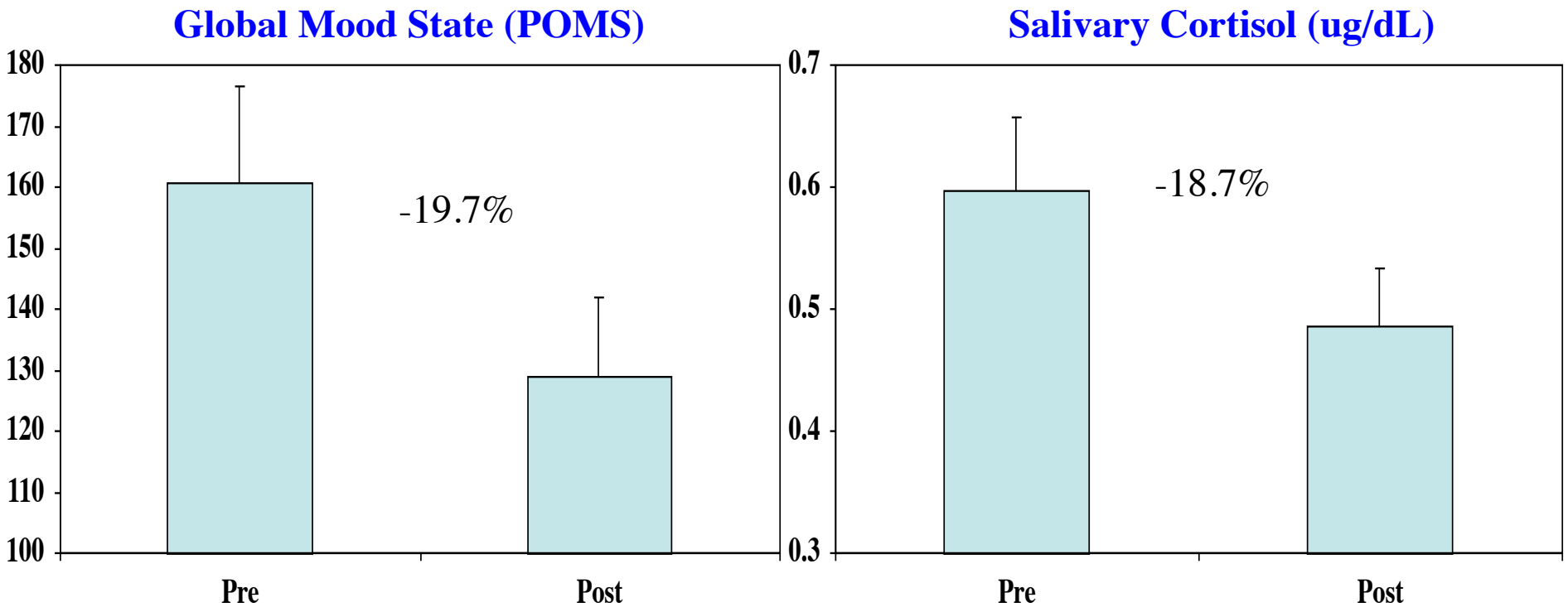
Holiday Stress - RESULTS

Global Mood State & Salivary Cortisol



Both, $p \leq 0.05$ compared to pre value

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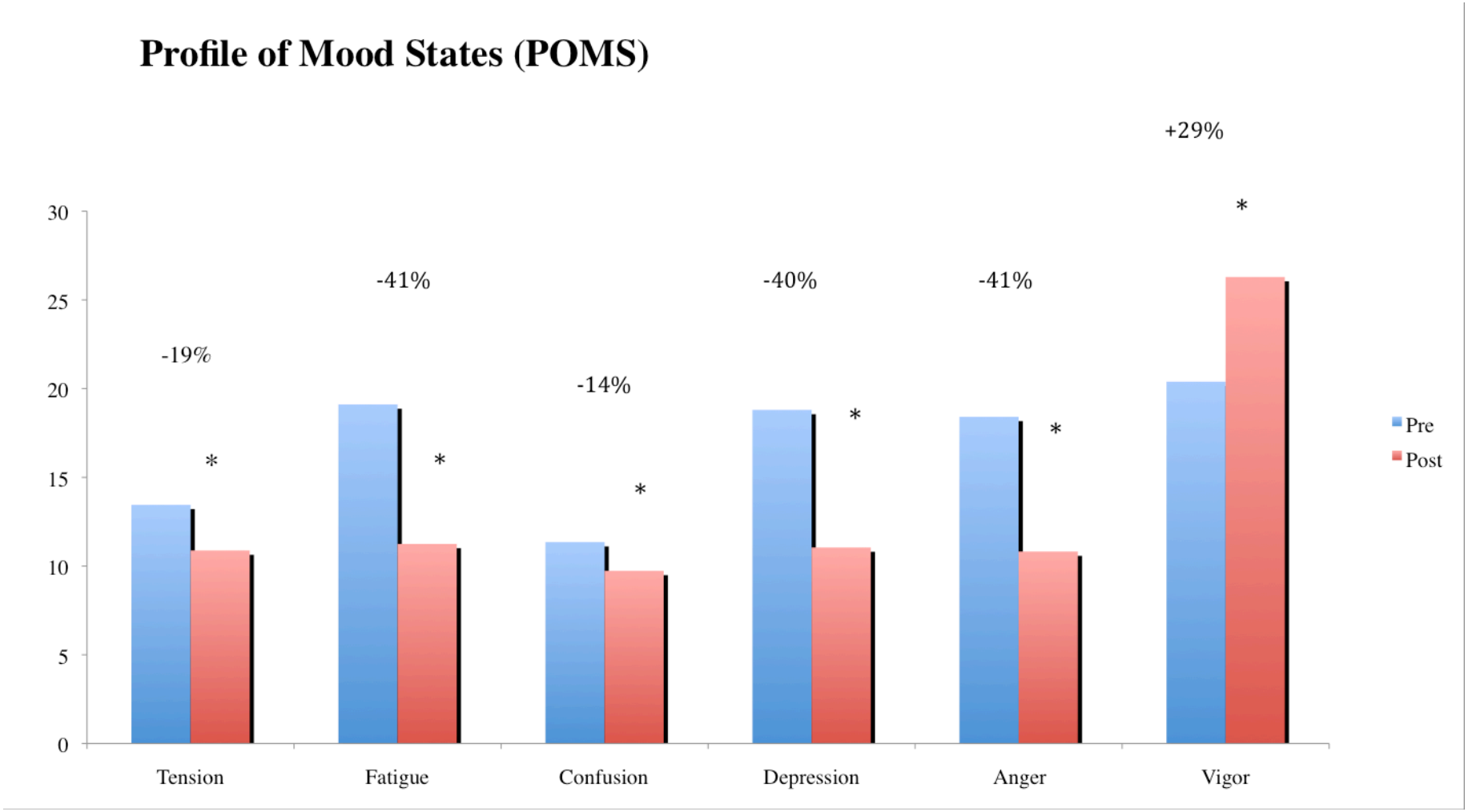
Holiday Stress - (POMS)



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Holiday Stress - CONCLUSIONS

- The combination of stress management, exercise, nutrition, and supplementation (8-week regimen) results in positive changes in mood, cortisol, body weight, body fat, and waist circumference - even during the "high-stress" holiday period - and that weight gain and "burnout" during this time of year is not "inevitable"

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Dieting Stress - BACKGROUND

- Weight loss induced only by dietary restriction results in undesirable losses in fat-free mass, elevations in cortisol, and reduction in testosterone levels.

- Combining dietary restriction with aerobic/strength exercise, is known to enhance fat loss and attenuate loss of muscle mass.

- This study examined the effects of combined stress management, exercise, nutrition, and dietary supplements on weight loss, mood state, & hormones

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Dieting Stress – Background
Poor Weight Loss with LCD

- Small weight loss observed with LCD Tx is attributed primarily to **"difficulties with patient adherence"** and "to metabolic adaptations induced by negative energy balance."

Diet	Weight Loss (kg/week)	Attrition (estimated)
Zone	.48	~35%
Weight Watchers	.13 - .44	~35%
Ornish	.14 - .45	~50%
Atkins	.45	~50%
Others (various LCD)	.07 - .48	~30-60%
SENSE	.46	~10%

•*Heymsfield SB, Harp JB, Reitman ML, Beetsch JW, Schoeller DA, Erondu N, Pietrobelli A. Why do obese patients not lose more weight when treated with low-calorie diets? A mechanistic perspective. Am J Clin Nutr 2007;85:346-54.*

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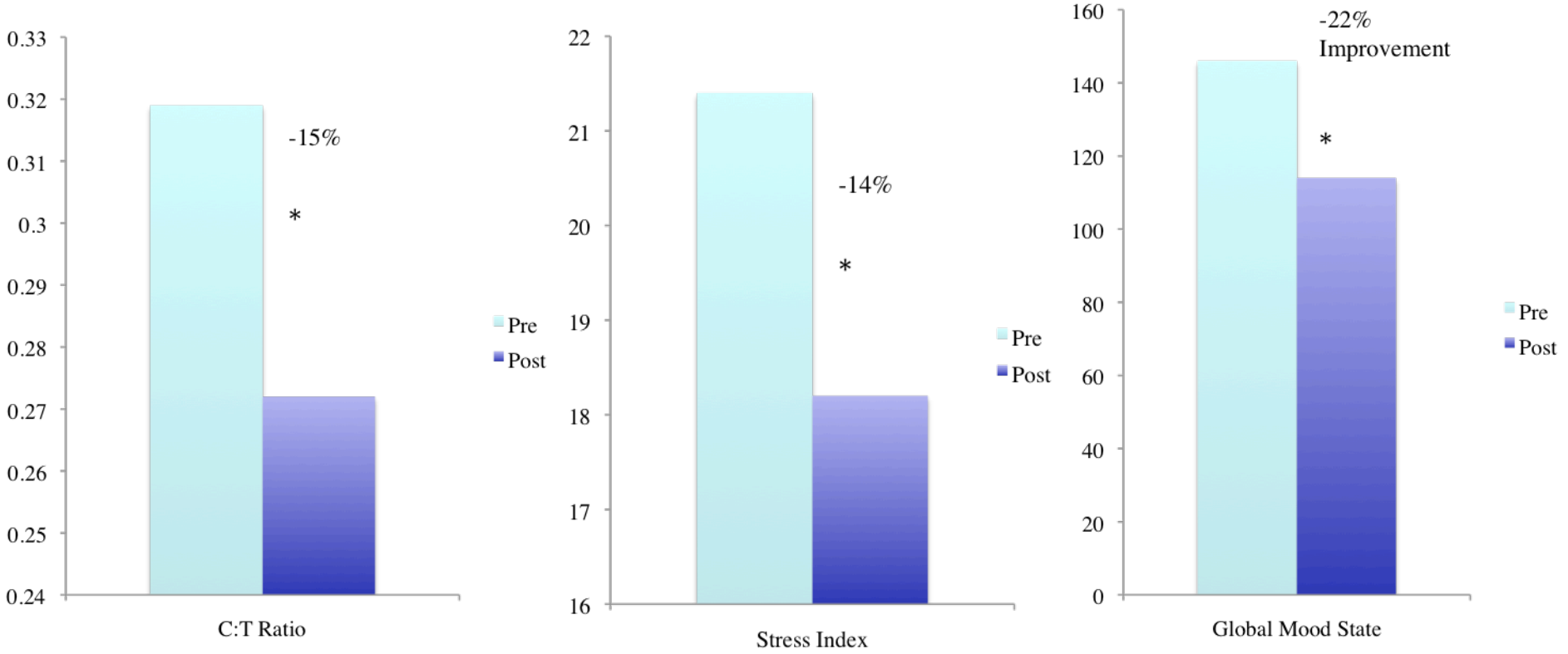
Dieting Stress - Results



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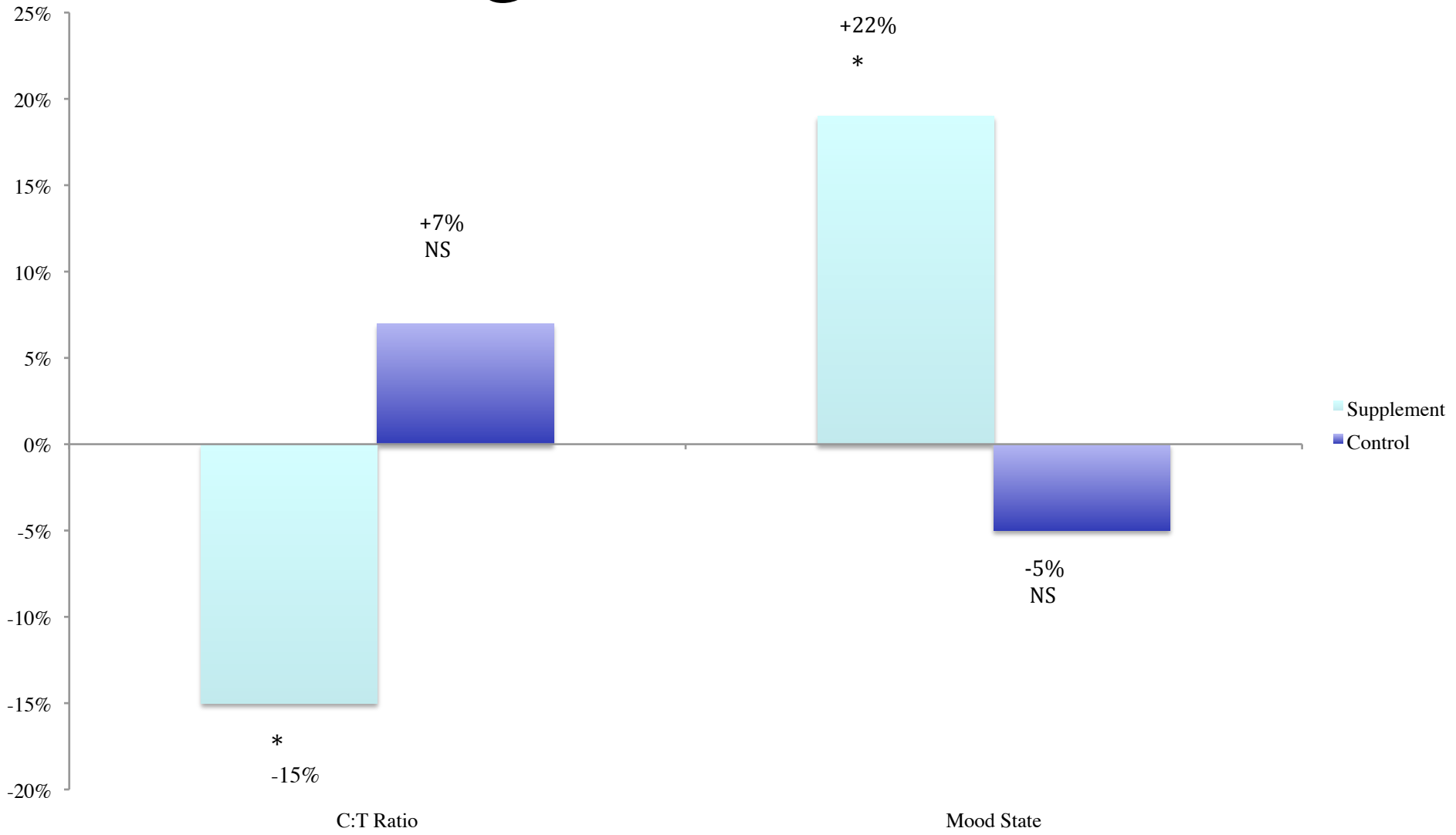
Dieting Stress - Results



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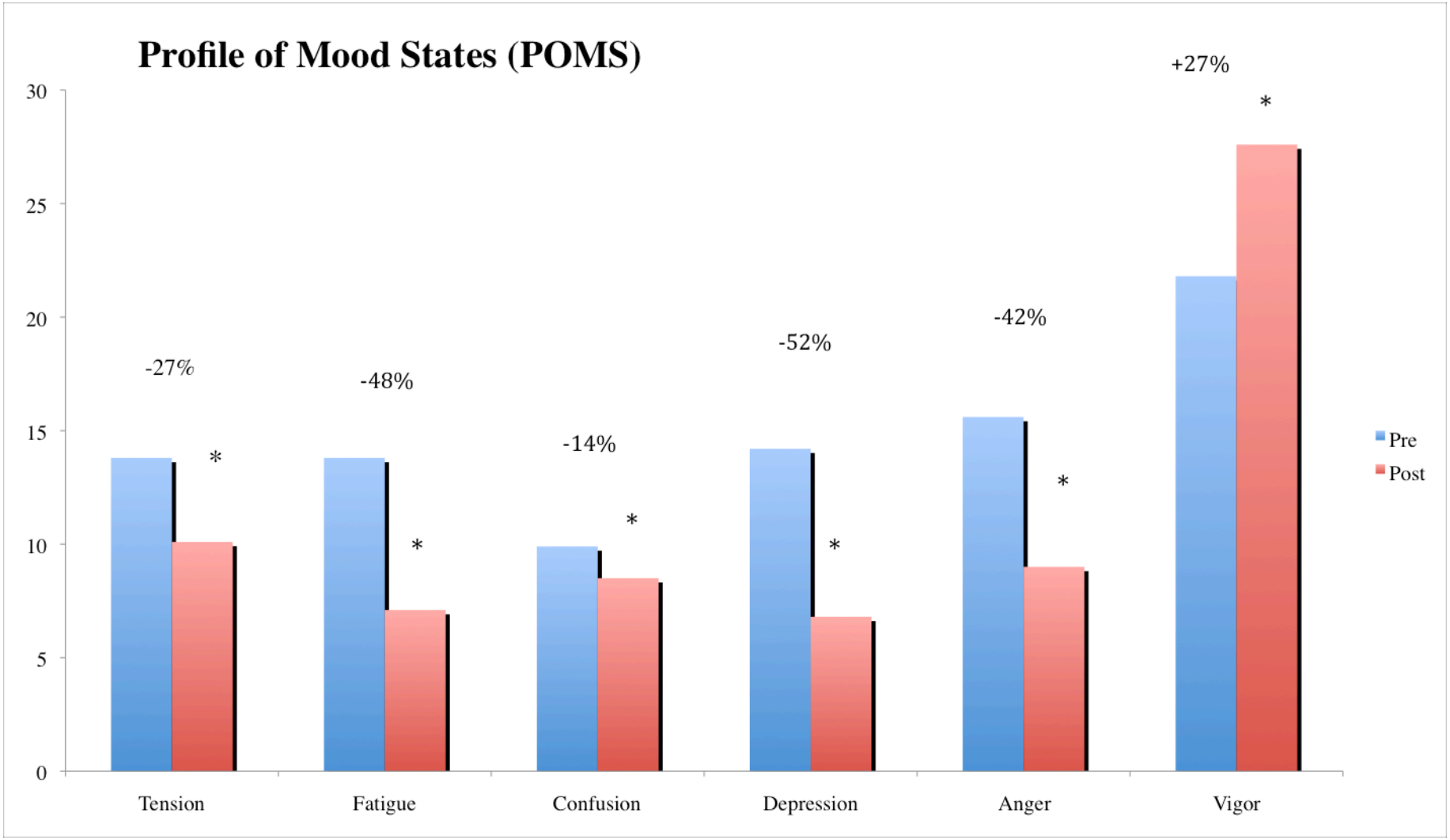
Dieting Stress - (POMS)



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Dieting Stress - CONCLUSIONS

- A modest diet/exercise regimen plus a daily dietary supplement (*Eurycoma longifolia*) prevents the expected decline in fat-free mass and resting metabolic rate – and results in favorable changes in body composition, hormone balance, and mood state.
- The low attrition rate suggests that effective weight loss and lifestyle regimens need not be overly restrictive, and thus, may be expected to result in superior long-term adherence and, possibly, better maintenance of weight loss.

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Overall Conclusions

- Chronic stress can disrupt hormonal balance
  - Cortisol to Testosterone Ratio (C:T)
- Stress hormone imbalance is associated with high levels of Fatigue/Depression, low Vigor, and Weight Gain
- Restoration of C:T ratio is associated with elevated Mood State, enhanced Vigor, and improved Fat Loss
- Improved Mood State may be linked with long-term health
  - Adherence to diet, exercise, stress management regimens…

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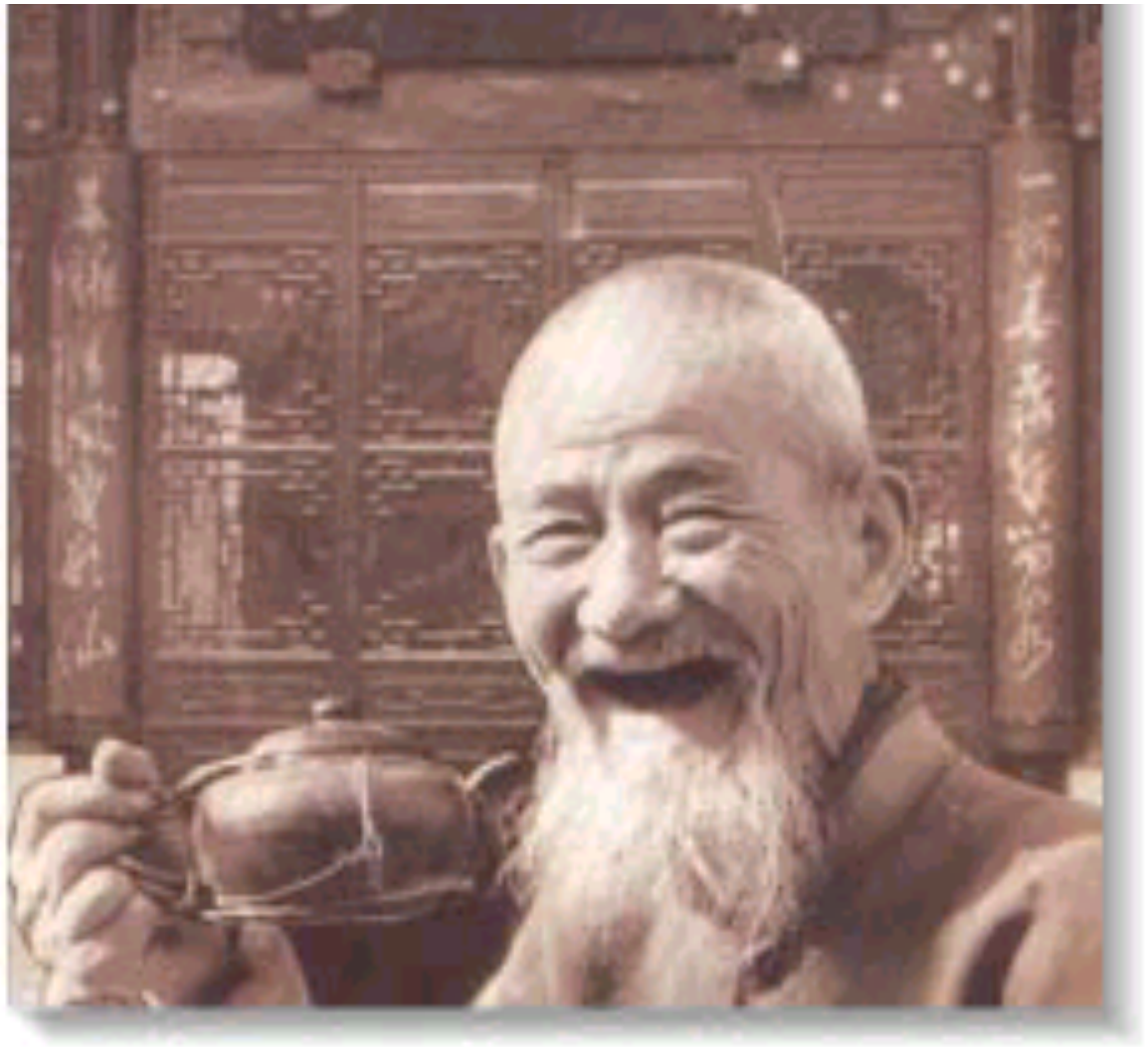
Thank You



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