Curves

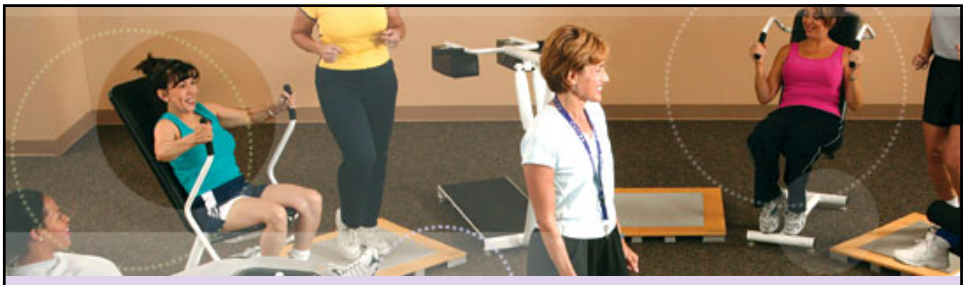
taking care of business

Overview

- ESNL Tour
- Research Findings
  - Curves I & II Combined
  - Curves Extension
  - Curves Calcium
  - Curves Osteoarthritis
  - Curves Intensity
  - Metabolism Study
- Ongoing/Planned Studies

Exercise & Sport Nutrition Lab

Baylor University



What are the overall effects of Curves I & II?

Curves I & II

14 Weeks of Curves Training

Testing Intervals

1- 2 Wk 1,200 kcal/d	8 – 9 Wk 1,600 kcal/d	4 Wk 2,600 kcal/d Intermittent 2d @ 1,200 kcal/d

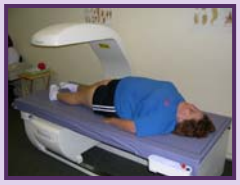
Control, EX Only, HCHO, MHP, VHP, HCD Diets

n=283

- At ***0, 2, 10, 10.4, & 14 W***:
  - ***Dietary Records*** (4-d)
  - ***Psychometric Tests***
  - ***Body Composition/Bone Density*** (DEXA)
  - ***Total Body Water*** (BIA)
  - ***Hip & waist measurement***
  - ***Resting HR & BP***
  - ***Fasting Blood Samples*** (12h)
  - ***Resting Energy Expenditure*** (REE)

- At ***0, 10, & 14 wks:***
  - ***Maximal Stress Test***
  - ***1RM Bench Press***
  - ***80% of 1RM on Bench Press***
  - ***1RM Leg Press***
  - ***80% of 1RM on Leg Press***
- Side effects were monitored by an RN on a weekly basis

Curves I & II

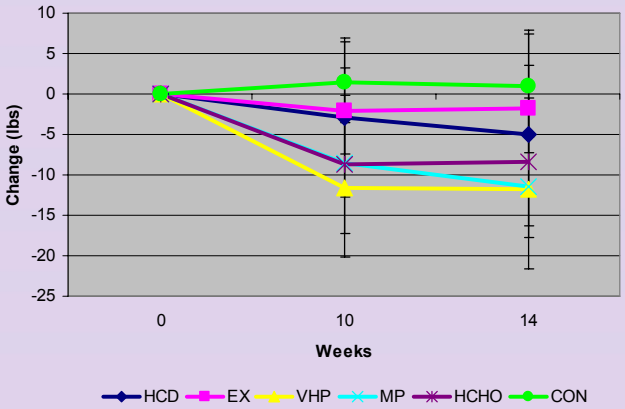


More evidence that HP diets promote greater weight loss!

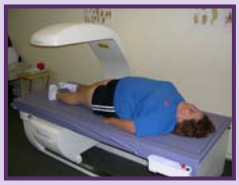
p = 0.001

Body Mass

n = 283



Curves I & II

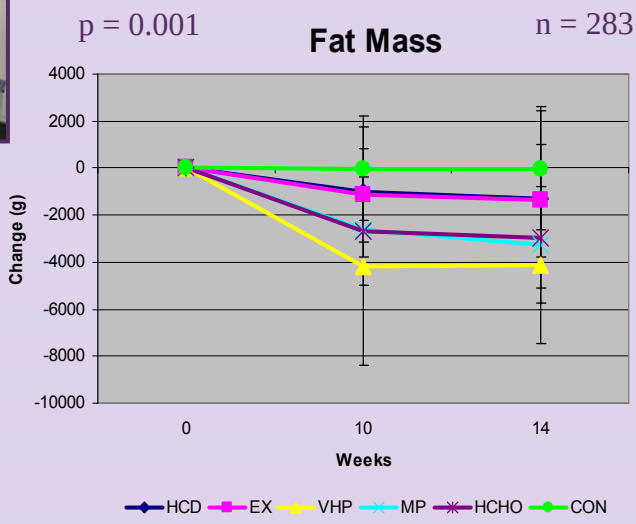


70 – 85% of weight loss is fat!

VHP diet promotes most fat loss!

p = 0.001

n = 283



Curves

Curves I & II

134 kcal/d

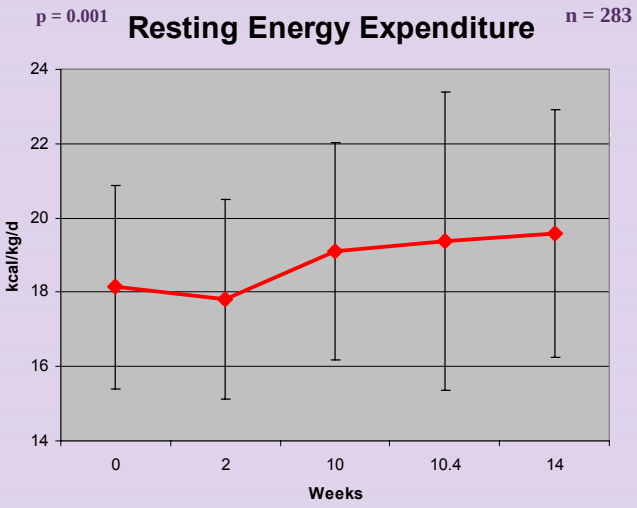
941 kcal/wk

1.16 lbs/mo

14 lbs/year!

p = 0.001

n = 283



Curves

Curves I & II

Variable	Impact of Curves
Body Fat	↓ (1.5 – 2%)
Waist & Hip	↓ (2-3”)
Resting HR	↓ (3.4%)
Resting SBP	↓ (3.2%)
Resting DBP	↓ (4%)
1 RM Bench Press	↑ (9%)
1 RM Leg Press	↑ (11%)
BP Endurance	↑ (22%)
LP Endurance	↑ (23%)

Statistically significant time effects ($p<0.05$).

Curves I & II

Variable	Impact of Curves
Maximal Oxygen Uptake	↑ (8%)
Total Cholesterol	↓ (5% @ 10W)
Triglycerides	↓ (7%)
Glucose	↓ (3%)
Leptin*	↓ (18%)
Fasting Insulin*	↓ (19%)
Insulin Sensitivity*	↑ (19%)

Statistically significant time effects ($p<0.05$).
* Curves II

Curves I & II

Variable	Impact of Curves
Appetite	↓ (9%)
Hunger	↓ (8%)
Feeling of Fullness	↑ (5%)
Energy	↑ (40%)
Quality of Diet	↑ (73%)
Physical Functioning*	↑ (10%)
Physical Limitations*	↓ (28%)
General Health*	↑ (6%)

Statistically significant time effects ($p<0.05$).
* Curves II

Curves I & II

Variable	Impact of Curves
Vitality*	↑ (15%)
Limitations Due to Emotional Factors*	↓ (20%)
Mental Health*	↑ (7%)
Appearance Evaluation*	↑ (28%)
Body Area Satisfaction*	↑ (19%)
Overweight Preoccupation*	↑ (10%)
Self-Classified Weight*	↑ (9%)

Statistically significant time effects ($p<0.05$).
* Curves I

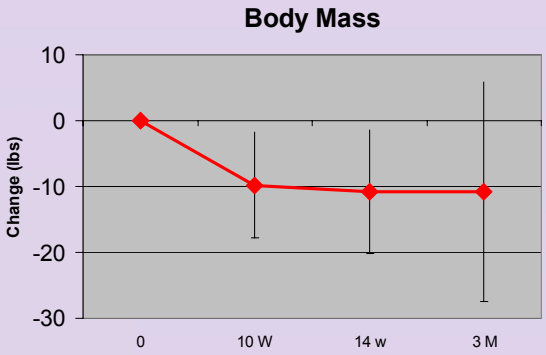
Curves is Taking Care of Business!

Promoting Weight-Loss & Improving Health &Fitness

Why do *diets* fail?

Most people *regain* weight lost within *6 – 12 months!*

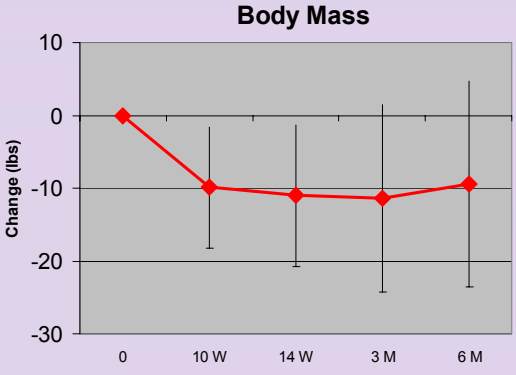
Curves Long-Term Study - Weight Loss



n = 164

Maintained Weight Loss!

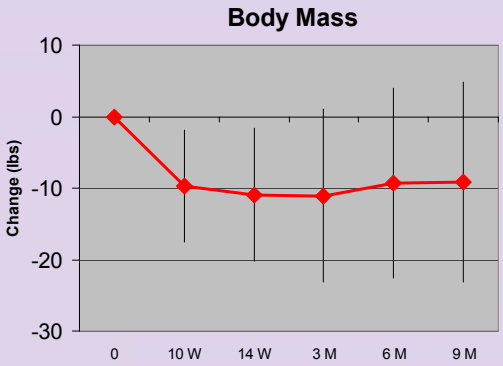
Curves Long-Term Study - Weight Loss



n = 107

Maintained Weight Loss!

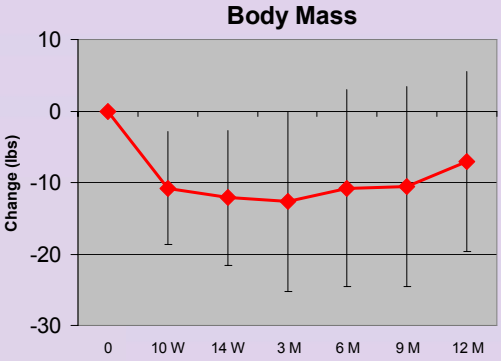
Curves Long-Term Study - Weight Loss



n = 84

Maintained Weight Loss!

Curves Long-Term Study - Weight Loss



n = 66

Maintained majority of weight loss after 1 year!

Curves is Taking Care of Business!

Promoting Long-Term Weight Maintenance!

Curves

What's New?

Calcium & Weight Loss

- Calcium is good for your bones and waistline!
- Currently conducting a study to determine whether calcium supplementation in post-menopausal women participating in the Curves program would promote greater fat loss
- Strongly recommend calcium supplementation for Curves

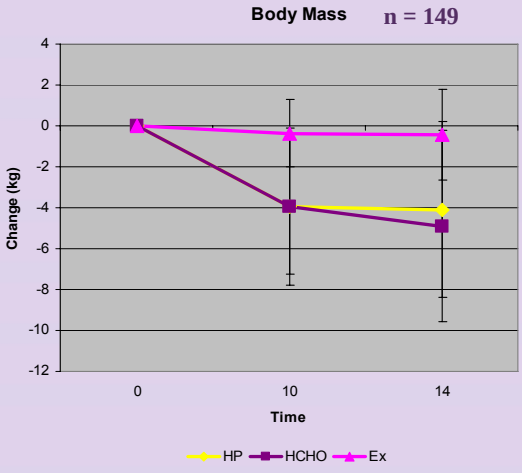
Curves Calcium

- 149 post-menopausal women:
  - 53.5±6 yrs
  - 46.3±5 % BF
  - 34.2±6 kg•m2 BMI
- Randomized into 3 groups
  - Exercise + No Diet
  - Exercise + High CHO Diet
  - Exercise + High Protein Diet
- Diet Program
  - 1 W @ 1,200 kcals/d
  - 9 W @ 1,600 kcals/d
  - 4 W @ 2,600 (High CHO);
    Diet for 2-d @ 1,200 kcal/d if gain 3 lbs

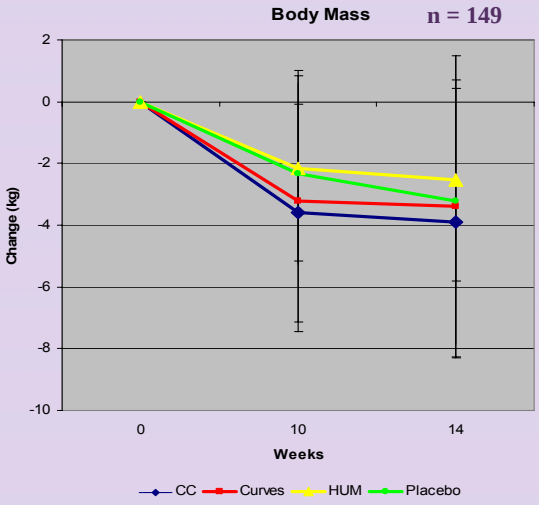
Curves Calcium

- Randomized and double blind assignment:
  - Placebo
  - Calcium Citrate (800 mg/d of calcium as citrate)
  - Curves Calcium (800 mg/d of calcium as citrate and malate and 400 IU/d of Vitamin D)
  - HUM Supplement (1,000 mg/d of calcium as citrate, 600 mg/d of green tea extract, and 200 mg/d of 7-Keto DHEA)

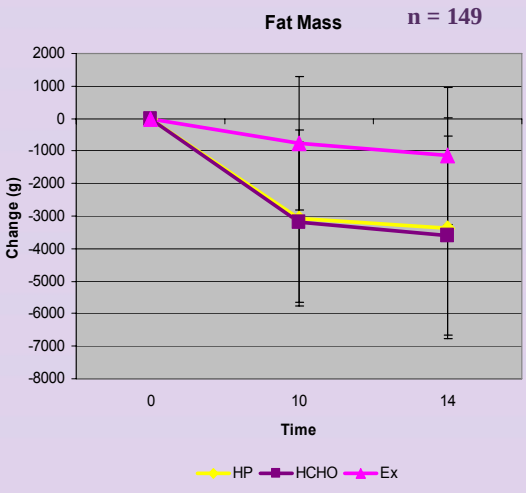
Curves Calcium - Body Mass



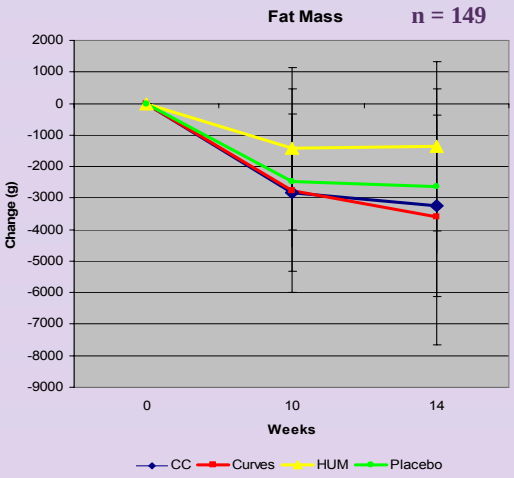
Curves Calcium - Body Mass



Curves Calcium - Fat Mass



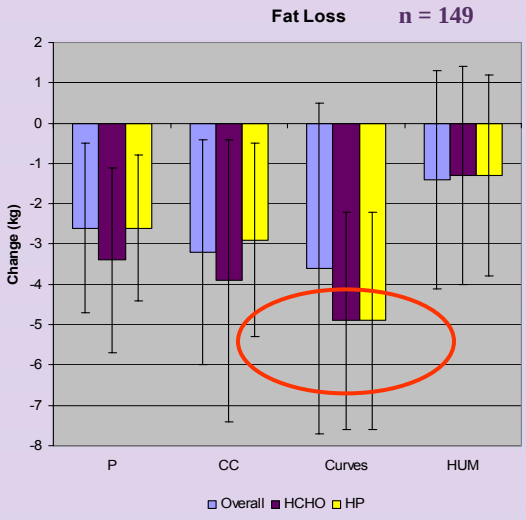
Curves Calcium - Fat Mass



Curves

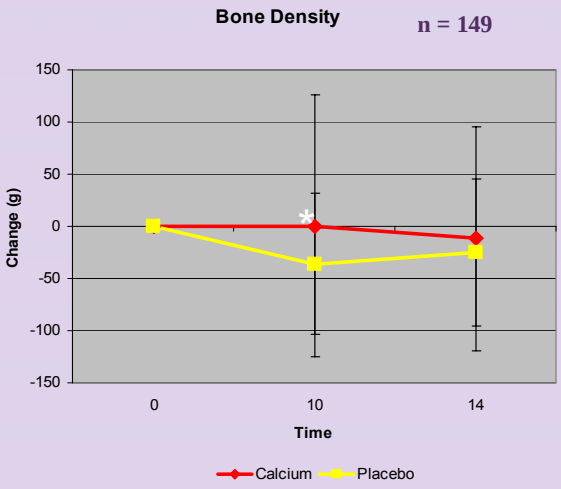
Curves Calcium - Fat Mass

- 36% - 44% greater fat loss when dieting!
- 26% - 69% greater fat loss than CC!



Curves

Curves Calcium - Bone Mass



Curves Calcium

- The Curves program is effective to promote and maintain weight loss in post-menopausal women
- Supplementation with Curves Bioavailable Calcium promoted greater weight loss when combining exercise with dieting

Curves is Taking Care of Business!

Post-Menopausal Women!

Curves

Curves Osteoarthritis

- 30 women with knee OA:
  - 55.1±7 yrs
  - 195.9±28 lbs
  - 64.2±13 in
  - 46.0±3 % BF
- Randomized into 2 groups
  - Exercise + High CHO Diet
  - Exercise + High Protein Diet
- Double blind randomization:
  - Placebo
  - Curves J&CT Support

Curves Osteoarthritis

14 Weeks of Curves Training

Testing Intervals

1 Wk 1,200 kcal/d	9 Wk 1,600 kcal/d	4 Wk 2,600 kcal/d Intermittent 2d @ 1,200 kcal/d

HCHO or VHP Diets

n=30

- At ***0, 10, & 14 W***:
  - ***Dietary Records*** (4-d)
  - ***Psychometric Tests***
  - ***Body Composition/Bone Density***
  - ***Total Body Water*** (BIA)
  - ***Hip & waist measurement***
  - ***Resting HR & BP***
  - ***Fasting Blood Samples*** (12h)
  - ***Resting Energy Expenditure*** (REE)
  - ***Knee flexibility***
  - ***Ratings of Knee Pain***

- At ***0, 10, & 14 wks:***
  - ***Maximal Stress Test***
  - ***1RM Bench Press***
  - ***80% of 1RM on Bench Press***
  - ***1RM Leg Press***
  - ***80% of 1RM on Leg Press***
  - ***Isokinetic Knee Tests***
  - ***Balance & Sit to Stand Tests***
- Side effects were monitored by an RN on a weekly basis

Curves Osteoarthritis

- Overall Results (Both Groups)
  - ↓ Body weight (-4.7±7 lbs)
  - ↓ Fat mass (-4.9±5 lbs)
  - No change in FFM
  - ↑ 1RM BP (14%)
  - ↑ BP Endurance (16%)
  - ↑ Knee Range of Motion
  - ↑ Sit to Stand Rising Index (10%)
  - ↑ Step Up/Over Lift Up Index (8%-11%)
  - ↓ Step Up/Over Movement Time (-15%)
  - ↑ Forward Lunge Distance (8%)
  - ↓ Forward Lunge Contact Time (-19%)
  - ↓ Forward Lunge Impulse (-17%)

Curves Osteoarthritis

- Overall Results (Both Groups)
  - ↑ Isokinetic Knee Extension Torque @ 60, 180 & 300 deg/sec
  - ↑ Isokinetic Knee Flexion Torque @ 60, 180 & 300 deg/sec
  - ↑ Relative Maximal Oxygen Uptake (6%)
  - ↓ VAS Knee Pain (-52%)
  - ↓ WOMAC Pain (-53%)
  - ↓ WOMAC Stiffness (-38%)
  - ↓ WOMAC Limitations in Physical Function (-46%)

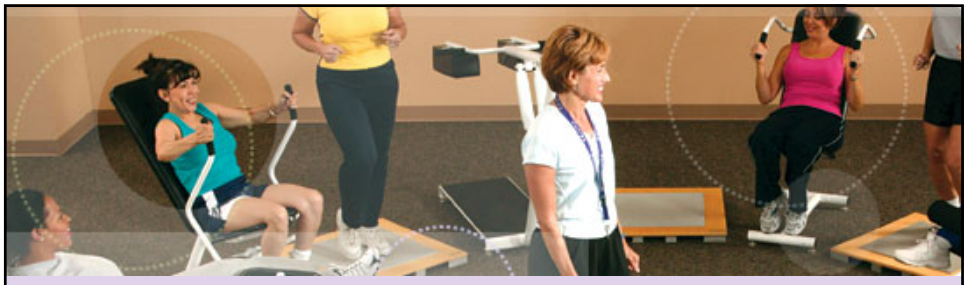
Curves Osteoarthritis

- Overall Results (Both Groups)
  - ↓ Appetite (-12%)
  - ↑ Energy (28%)
  - ↑Quality of Diet (21%)
  - ↑ QOL - Physical Functioning (59%)
  - ↑ QOL - Vitality (120%)
  - ↑ QOL - Social Functioning (65%)

- Curves J&CT Support supplementation tended to reduce perceptions of knee pain (p=0.10)
- Additional research is needed with a larger number of subjects over a longer period of time

Curves Osteoarthritis

- Curves fitness & weight loss program promotes weight loss, improves fitness, and increases functional capacity in women with OA
- Curves JCT Support supplementation may have some therapeutic benefit on reducing pain



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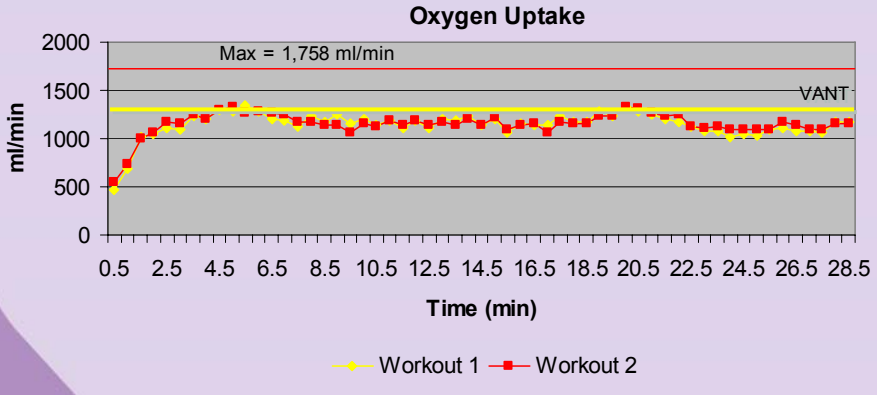
Women with Osteoarthritis!

Curves

Energy Expenditure Analysis

- 33 sedentary subjects
  - 53 ± 7 yrs
  - 193 ± 32 lbs;
  - 64.5 ± 3 in
  - 1.8 ± 0.28 L/min VO2max (5.9 METS)
  - 151 ± 15 max HR
- Subjects performed the Curves 30-min workout 2 time
- Exercise VO2 and CO2 measurements obtained using a CosMed K4b portable metabolic measurement system
- Metabolic cost, energy expenditure, and CHO/Fat oxidation determined

Energy Expenditure



1.12 L/min or 63% VO_2 max

5.5 kcal/min or 165 kcals/30 min

RER of 0.98

Heart Rate Analysis

- 78 subjects
  - 53.6 ± 7 yrs
  - 192 ± 30 lbs;
  - 43.5 ± 5 % BF
  - 66 ± 9 Supine RHR
  - 151 ± 17 max HR
- Subjects performed the Curves 30-min workout on two occasions
- HR determined from Polar HR monitors
- Max HR obtained during maximal treadmill GXT
- HR observed during workout compared to percentage of max HR

Heart Rate Analysis

- Mean HR - 119±15 bpm
- 79% max HR ([Ex HR / Max HR] x 100)
- 63% of Heart Rate Reserve ([Ex HR – RHR] / [Max HR – RHR] x 100)
- Biomechanical studies indicate that exercise intensity ranges from 61% - 73% of 1RM with good reliability (r=0.71 to r=0.87)
- Curves exercise intensity meets ACSM & NSCA guidelines

Curves is Taking Care of Business!

Curves is the Right Type and Amount of Exercise!

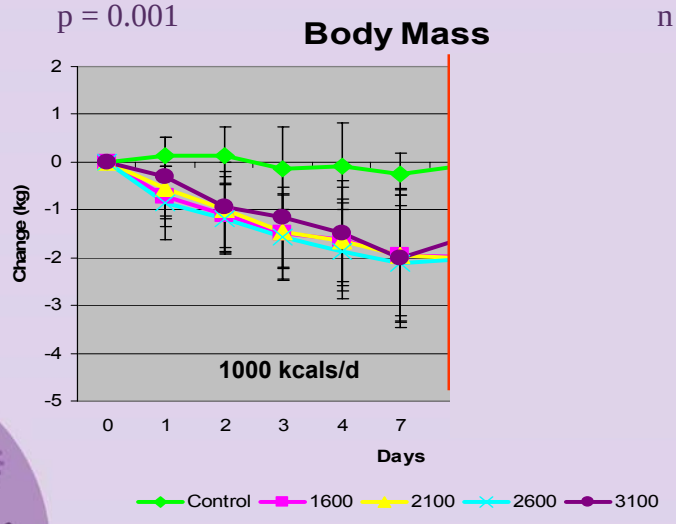
Metabolism Study

- Subjects consume a 1,000 kcal/d high CHO or PRO diet for 7 days and then:
  - 1,600 kcal/d mixed diet for 7 days
  - 2,100 kcal/d mixed diet for 7 days
  - 2,600 kcal/d mixed diet for 7 days
  - 3,100 kcal/d mixed diet for 7 days
- Weight, body water, body composition, REE, and hormones assessed at 0,1,2,3,4,7,8,9,10,11,12,13,&14 d
- 122 sedentary subjects completed study:
  - 42±11 yrs
  - 64.6±3 in
  - 216±40 lbs
  - 45.6±4.8 %
  - 36.5±6.2 kg•m2 BMI

Metabolism Study

p = 0.001

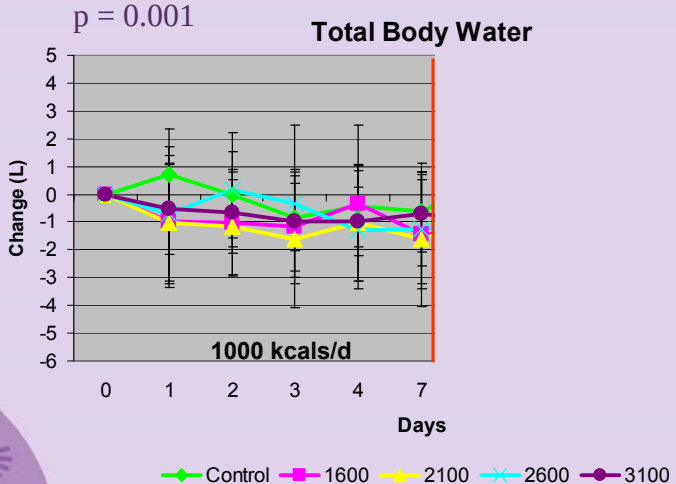
n = 122



Metabolism Study

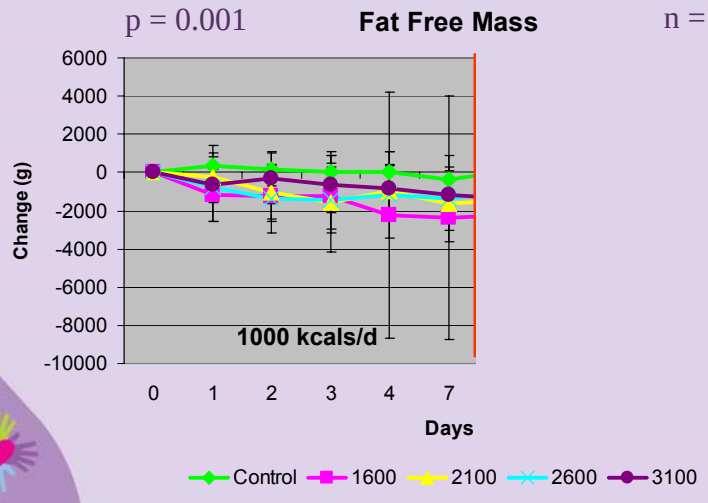
p = 0.001

n = 122



Metabolism Study

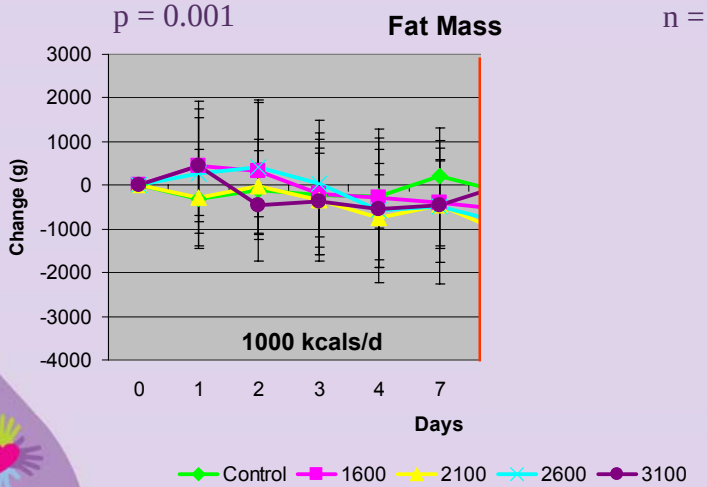
p = 0.001



n = 122

Metabolism Study

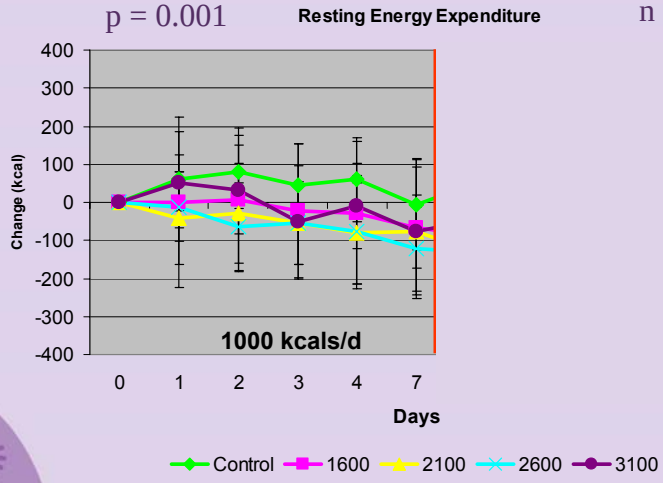
p = 0.001



n = 122

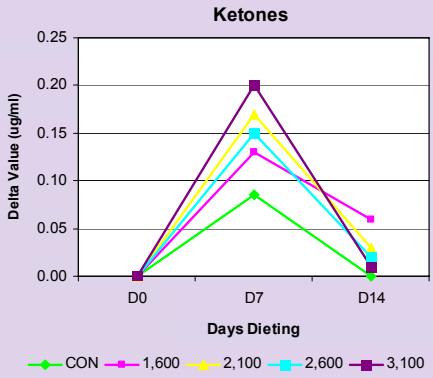
Metabolism Study

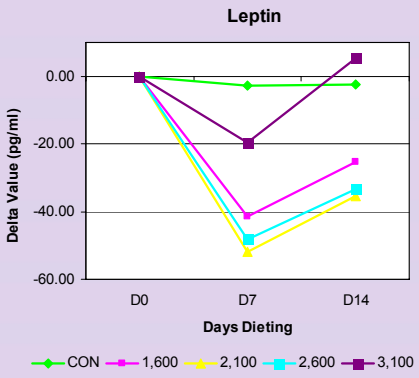
p = 0.001



n = 122

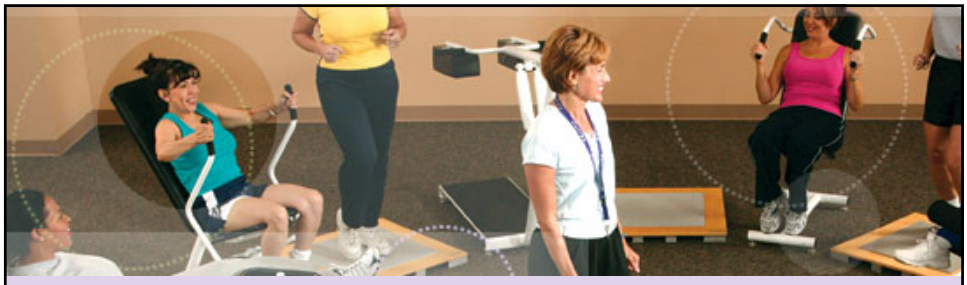
Metabolism Study





Metabolism Study Observations

- Dieting decreased body weight, body water, fat mass, fat free mass, REE, and appetite hormones (leptin, ghrelin, etc.)
- Increasing energy intake up to 2,600 kcals/d did not promote weight regain
- It may take 7 or more days for REE to fully rebound without exercise



Curves is Taking Care of Business!

Promoting Weight Loss without Sabotaging Metabolism!

Curves

Ongoing & Planned Studies

- Curves in High Risk Populations (hypertension, diabetes, elderly)
- Effects of Using New "Smart" Equipment on Fitness Gains from Curves
- Effects of Curves and different diets on gene expression
- Exercise Intensity & Energy Expenditure of Highly Trained Women Using Curves
- Web-based Study

Curves is Taking Care of Business!

The most extensively studied and scientifically validated exercise & weight loss program in the industry…period!

Curves

Exercise • Nutrition • Health • Performance

BU ESNL

BAYLOR UNIVERSITY

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