

**The Fitness Effects of A Horseback Riding Machine Combined with A Dietary Modification Program:
An Eight-Week Study**
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Research Summary

Exercisers are seeking means to gain fitness in general, and have an increased interest in core strength because of its' relationship to back health, activities of daily living and sports performance. If novice exercise participants can improve general fitness, core strength and other measures simply, they are more likely to start and maintain a fitness regime. For this study, a Core Trainer (Panasonic Corporation, Osaka, Japan) was used as an exercise intervention that simulates horseback riding. The device has a manual program, as well as forward tilt, backward tilt and side-to-side programs that have different levels of tilt from flat to forward or back. There is also a speed button that allows the user to go progressively faster in any mode, with the slowest speed being 44 cycles per minutes, with the fastest speed being 88 cycles per minutes. The Subjects completed an 8-week program with pre and post-assessments for a wide range of fitness variables. In addition to exercise, the subjects were given a basic dietary modification program based upon individual analysis.

After statistical analysis, the Core Trainer provides a sufficient training stimulus for individuals to make significant gains in core strength, hip and back flexibility, and dynamic balance. The Core Trainer in this study produced moderate gains in leg strength, strength balance, body composition and VO2 Peak.

Study Methodology

11 subjects, (5 male, 6 female), underwent physiological testing for VO2 peak (aerobic endurance), body composition (ratio of lean weight/muscle to fat weight), balance, isokinetic strength, flexibility, resting energy expenditure and core strength. After subjects completed health history, informed consent, resting measures for height, weight, blood pressure and body composition from seven-site skin fold measures were recorded. Dietary recall was performed via computer analysis for major trends and kcal intake compared to actual REE levels. Resting energy expenditure and VO2 peak were recorded using a Sensormedics Vmax 29c using bicycle ergometry. Strength was assessed using an isokinetic dynamometer set to approximate 160 degrees per second, which would give an indication of abilities and changes in combined strength/endurance for 20 repetitions including measures of chest press, basic row, shoulder press, lat pull down, leg extension, leg curl, abdominal crunch and back extension. Additionally, an ACSM style field test of an abdominal crunch motion was also performed. Dynamic balance was assessed for a total time in balance out of a possible 30 seconds. Flexibility was determined for hips; low back and torso rotation using both common sit and reach tests as well as goniometer measurement for each side of the subjects' body.

For the first week, subjects exercised for 15 minutes for three sessions under supervision, with two remaining sessions at home. For weeks 2-8, the subjects were under supervision for one session per week, with the remaining four sessions performed at home. The program progressed in speed and difficulty over the eight weeks and added upper body exercises during the fifth week using a two-pound medicine ball. Individual progressions were adjusted based upon individual ability to follow and successfully complete the previous weeks' program.

Results

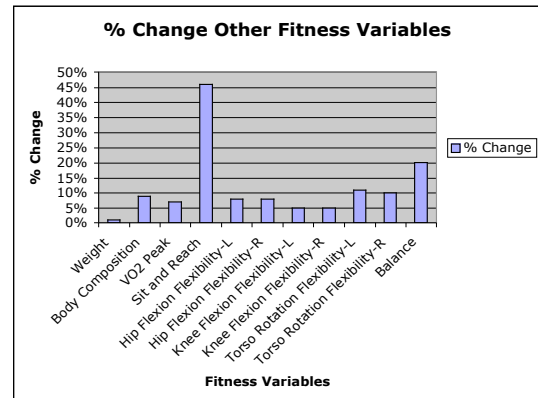
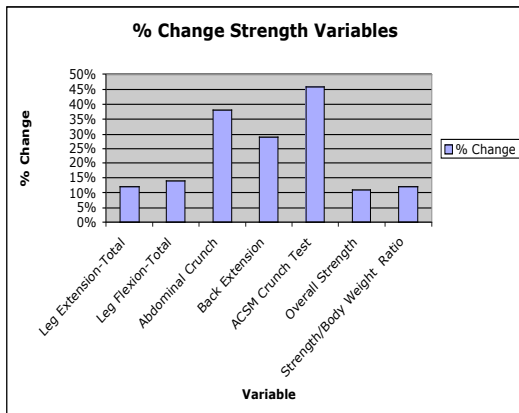
After the 8 week program, paired T tests revealed statistically significant ($p < .05$), gains and improvements in VO2 (7%), body composition improvement/decrease (9%), quadriceps strength when combining both legs (12%), hamstring strength when combining both legs (14%) abdominal strength (38%), back strength (29%), abdominal crunch test (46%), overall strength to body weight ratio (12%), sit & reach flexibility (46%), and balance (20%).

In conclusion, as measured in this study, the Core Trainer provides a number of positive fitness benefits besides increased core strength when combined with a modest dietary modification program.

Table 1, Overall Results

Variable	Pre/Start	Post/Finish	Change	%Change	Statistical Significance, P = .05
Weight (pounds)	208.32	205.27	3.05	1.00%	yes
Body Composition(% body fat)	29.52	26.94	2.58	-9.00%	yes
Resting BP(systolic/diastolic)	130/84	129/84	0	0	yes
Resting Energy Expenditure(Kcal per day)	1809	1827	18	1%	No
VO2 PEAK (mlO2/min/-1)	25.84	27.77	1.93	7.00%	yes
Sit and Reach Test (centimeters)	-12.18	-5.55	6.63	46%	yes
Hip Flexion-Left (degrees)	108.91	118.09	9.18	8.00%	yes
Hip Flexion-Right	111.09	120.36	9.27	8.00%	yes
Knee Flexion-Left	119.36	125.27	5.91	5.00%	yes
Knee Flexion-Right	117.27	125.55	6.19	5.00%	yes
Torso Rotation-Left	56.36	62.64	6.28	11%	yes
Torso Rotation-Right	56.27	61.64	5.37	10.00%	yes
Chest Press (ft. pounds for 20 repetitions)	1062	1071.73	9.73	<1%	No
Row	1131.73	1175	44	4.00%	No
Shoulder Press	417.55	408	-9.55	-2.00%	No
Lat Pulldown	906.09	836.45	-69.64	-8.00%	No
Leg Extension-L	293.73	326.55	32.82	11%	yes
Leg Extension-R	294.36	329.73	35.37	12%	Marginal singularly, Yes together
Leg Flexion-L	368.73	423	54.27	15.00%	yes
Leg Flexion-R	370.09	417.18	47.09	13.00%	Marginal singularly, Yes together
Abdominal Crunch	258	355.36	97.36	38.00%	yes
Back Extension	314.55	406.36	91.81	29%	yes
Overall Strength	5152.55	5695.45	542.9	11.00%	yes
Strength/Body Weight Ratio (total/body weight)	25.02	28.06	3.04	12%	yes
ACSM Crunch Test (number performed)	43.45	63.64	20.19	46%	yes
Balance (Time in balance out of 30 seconds)	10.73	12.83	2.1	20.00%	yes

Table 2, Specific Variable Improvement/Change



Selected References

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