

Weight Loss: A Sex-linked Trait

Exercise researchers now have more evidence that a slow, moderate workout may be the best choice for women who want to burn fat and lose weight. But many men—except for those who are chubby—can get good results from a shorter, slightly more intense exercise session, reports ARS nutrition researcher Nancy L. Keim.

For the study, 32 male and 32 female volunteers pedaled on an

In general, the male volunteers not only burned more calories while cycling at the same intensity as the females, but also burned more fat calories—that is, calories derived from fat.

- exercise bike
- through a
- series of 5-
- minute stints.
- The workouts
- were made
- progressively
- more difficult
- by increasing
- resistance on
- the bike's
- braking
- mechanism.
- From these
- mini-work-
- outs, Keim
- calculated the
- number of
- calories—and
- calories
- derived from
- stored fat—
- that these
- volunteers
- would have

burned if the sessions had extended a half hour.

Keim did the tests at the ARS Western Human Nutrition Research Center in San Francisco, California. She collaborated with Teresa F. Barbieri of the center and former ARS researcher Amy Z. Belko, who is now a physician in private practice. Belko originated the study.

So that results would be useful for as many people as possible, they excluded elite athletes from the experiment; volunteers' fitness levels were

from “average” to “good.” And the group included volunteers who were slightly below or as much as 40 percent above their desired weight.

Most female volunteers, says Keim, would have needed to work out approximately twice as long as the males to burn 300 calories. The 300-calorie

For those not familiar with computing calories and heart rates, Keim offers some handy figures: Normally adult women burn about 1,900 to 2,200 calories a day. Men use about 2,300 to 2,900. The minimum intensity, or heart rate, recommended for workouts translates to about 115 beats

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In studies comparing calorie expenditure of men and women, nutrition researcher Nancy Keim monitors volunteers during cycling exercise. (K5960-1)

target is the workout minimum recommended by the American College of Sports Medicine for weight loss.

These specialists advise 300-calorie workouts three to five times a week, with a minimum intensity of 60 percent maximum heart rate.

a minute for a 30-year-old man or woman. (You can estimate your maximum heart rate by subtracting your age from 220.)

To burn 300 calories, with as many of those calories from fat as possible, most of the women in the experiment would have had to exercise from 46

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to 60 minutes at about 65 percent maximum heart rate.

Men, depending on their fitness level, would have had to cycle for only 28 to 35 minutes, at the same intensity, to burn the 300 calories.

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cycling at the same intensity as the females, but also burned more fat calories—that is, calories derived from fat.

“That came as no surprise, because fat tissue in men,” says Keim, “is generally more responsive to the adrenaline produced during exercise.”

Adrenaline acts to release fat from fat cells so that it can be used by the muscles for energy.

Keim was surprised, however, to find that men with a higher level of body fat had lower fat-burning rates. That finding was true regardless of the man’s level of fitness.

Another study, reported earlier, showed the same trend: Tests of men who jogged on a treadmill revealed that volunteers with more body fat had lower fat-burning rates.

Keim estimates that among the males who volunteered for the ARS study, most who worked out at 70 to 75 percent of their maximum heart rate would burn an estimated 303 to 392 calories in 30 minutes, depending on their fitness level. From 45 to 153 of those calories would be from fat. The 70 to 75 percent maximum heart rate is higher than the 60 percent minimum recommended by the American College of Sports Medicine.

Women would burn from 177 to 226 calories, with 27 to 54 of these calories from fat. “For most female volunteers,” says Keim, “a 30-minute session at 70 to 75 percent maximum heart rate would fall short of the 300-calorie minimum, even for the fittest women in the study. Yet all but 5 of the male volunteers would have hit—or passed—the 300-calorie-target in a half-hour or less.”

The rare exceptions included Todd, a portly, 34-year-old couch potato, who would have burned only 253 calories at the 70 to 75 percent maximum heart rate. But even that modest amount was 7 calories more—and 5 times as many fat-derived calories—as those burned by Sheri, 31, who is lean and fit. At that heart rate, Todd would have had to work out another 6 minutes, and Sheri would have needed to pedal another 7, to reach the 300-calorie mark. [Volunteers’ real names are not used in this article.]

Unlike Todd and Sheri, Eric and Lori shared the same fitness level. Both are slender 27-year-olds of average fitness. Despite the similarity in fitness, Eric would have burned about 64 percent more calories than Lori, with about 55 percent more calories from fat, in a half-hour. Lori would have needed to work out another 17 minutes to meet the 300-calorie minimum.

The study is part of Keim’s ongoing project to determine the relation between amount of stored body fat and the body’s fat-burning rates during and after exercise.

“Eating too much, which can lead to excess body fat,” says Keim, “is America’s No. 1 nutrition problem. The best way to lose weight is to eat less and exercise more. But specific recommendations about exercise have generally been made from studies of young, lean men—often athletes. We need to develop recommendations suited to overweight people.”

Results of the San Francisco study, says Keim, can be used by physicians, nutritionists, and weight loss counselors to help customize the exercise regimens of overweight and normal-weight patients alike.

Keim admits she changed her own exercise habits after scrutinizing the study results. “When I took the no-pain-no-gain approach,” she says, “I pushed myself too hard and always quit too soon. Now I’ve found that it’s more enjoyable to keep a smooth and steady pace. And I’m more likely to go back and work out again the next day.”—By **Marcia Wood, ARS.**

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