

# NASA Newsletter

September 2018

## Strength-Training vs. Cardio: Which is More Effective for Weight Loss?

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Exercise is an important tool in your weight loss arsenal, although what and how much you eat is, ultimately, more important for shedding those extra pounds of body fat. Conventional wisdom says when you want to lose body fat you should do more calorie-burning exercise, namely, cardio. A cardiovascular workout does burn calories and is good for heart health, but how does it compare to strength training for weight loss?

### Losing Weight: Is Cardio or Weights More Effective?

If you measure calories burned, cardio sessions have an advantage over lifting weights, namely, it's a calorie burner. For example, if you weigh 150 pounds, you'll burn around 225 calories if you jog for 30 minutes. If you pick up the speed and break into a run, you burn around 350 calories over that 30 minutes. How about 30 minutes of strength training? You'll only expend between 150 and 230 calories during a strength-training session. The precise number will depend on how heavy you're lifting and how long you rest between sets.

If you're considering calorie burn only, a cardio session would seem to be the best choice. But, what about high-intensity interval training, a more intense form of cardio? High-intensity interval training, or HIIT, burns calories while you're doing it. Plus, you'll burn some extra calories afterward due to the after-burn. In fact, research shows that high-intensity interval training blasts around 25% more total calories than a moderate-intensity cardio workout performed for the same length of time.

Still, both forms of cardio burn more calories than strength training. So, isn't cardio the form of exercise you should focus on if you're trying to lose body fat? Well, it doesn't have to be "either-or." The best workouts are balanced and include some of each form of exercise. Yet, there are some compelling reasons that strength training should figure prominently in your weight loss efforts.

### Strength Training and Weight Loss

Although strength training doesn't burn as many calories minute-by-minute as cardiovascular exercise, it builds muscle, and we know that muscle is more metabolically active, meaning that it burns more calories. The more muscle you have on your body, the more of a calorie deficit you'll incur over the course of a day. In contrast, if you do long periods of cardio without weight training, you'll likely lose muscle and burn fewer calories. In other words, your resting metabolic rate will slow.

The impact of having additional muscle is subtle but it counts. It's not uncommon to hear overblown claims about how many extra calories a pound of muscle burns. For example, you may have read that each additional pound of muscle you carry on your frame burns 50 added calories over the course of a day. The reality is, depending on the source that value is between 6 to 10 additional calories daily. The previous claims were a bit overstated, as confirmed by more recent research. But, we'll take even a few extra calories, right?

So, the extra calories you burn when you have more muscle isn't enormous. It's also not clear whether strength training suppresses appetite and leads to weight loss due to reduced food intake. One study found that an intense, cardio workout on a treadmill suppressed the appetite hormones, ghrelin and peptide YY. Suppression of these hormones would lead to a reduction in appetite. In contrast, 90 minutes of weight training dialed back only one of the two appetite hormones, ghrelin and didn't stymie it as much as a vigorous cardio workout. Based on this, vigorous cardiovascular exercise is more effective for suppressing appetite, but strength training may curb appetite to some degree as well.



*A cardio workout burns more calories than a weight-training workout. However, your metabolism may stay elevated for longer after weights than cardio, and weightlifting is better for building muscle. Thus, the ideal exercise program for improving body composition and health includes cardio and weight-training....*

### Why You Still Need Strength Training

We already mentioned the small metabolic benefits you get when you have more muscle. It's modest but can have an impact over a long period of time. However, it's ultimately body composition that matters most, not a number on a scale. When you lose weight, you shed both body fat and muscle. Since weight training is anabolic and moderate-intensity cardio is catabolic, you expect to lose more muscle when you do cardiovascular exercise than when you strength train.

How do we know this? In a study carried out by researchers at Penn State, a group of overweight subjects lost 21 pounds through diet and exercise. They lost roughly the same amount of weight whether they did cardio or strength trained. The difference is, on average, the strength trainers lost almost exclusively body fat while the cardio group lost 6 pounds of muscle.

Ultimately, it's not in your best interest from a health, fitness, or aesthetic perspective to lose muscle. We lose muscle as we age anyway and need to do whatever we can to preserve it so we can stay functional. Who wants to be frail? Strength training helps you preserve it and build more. Plus, strength training builds confidence and self-esteem.

### Keep It Balanced

The take-home message is you need both cardio and strength training. If you're trying to lose weight, you want to lose body fat while preserving as much muscle as possible. The two ways to do that are to strength train and consume enough protein. If you're physically active, aim for around 1.6 grams of protein per kilogram of body weight. You need more protein to help repair the damage your muscles sustain when you do cardio or lift weights and to keep your body out of a catabolic state. Protein also helps with appetite control. You don't have to get it all from meat and dairy, choose more plant-based foods and you'll also benefit from the fiber plants offer.

### The Bottom Line

Don't be cardio obsessed if you're trying to lose body fat. Do some cardio but balance it out with strength training. Training your muscles against resistance is something we all need to do, especially as we age. The biggest benefit of strength training is it will help you maintain a healthy body composition when you lose weight. So, take advantage of it!

**CARDIO VS STRENGTH TRAINING**

Strength Training Benefits	Cardio Benefits
- decreases body fat	- increases energy level
- increases energy	- increases liver, kidney, and heart health
- strengthens bones	- improves cardiovascular health
- tones entire body	- improves circulation
- improves mobility	- improves metabolism
- increases metabolism	- improves coordination
- increases endurance	- improves circulation
- helps with coordination	- decreases depression & anxiety
- strengthens tendons, ligaments and joints	- improves sleep
- prevents injury	
- decreases depression and anxiety	

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## Are There Legitimate Ways to Boost Your Metabolism?

Flip through any magazine devoted to health or fitness and you'll see articles with titles like "X Ways to Power Up Your Metabolism" or some other reference to boosting resting metabolic rate. Many people gravitate to titles like this as they are looking for an easy way to lose weight. What better way than to fire up your inner furnace and burn more energy?

But, if you read these articles, you may find the suggestions they offer are overhyped. The truth is that there are no "magic" ways to massively dial up your metabolic rate and turn your body into a fat-burning machine. But, there are ways to subtly increase how many calories you burn in a day. Let's look at some metabolism-boosting habits backed by science.

### Factors that Influence Your Metabolic Rate

How rapidly you expend energy depends on your resting metabolic rate and two additional components, the extra calories you burn due to exercise and the calories you burn when you eat something. Yes, you burn calories when you consume food as the food has to be digested and processed. But, your resting metabolic rate comprises the bulk of the energy you burn every day, around 70%

Unfortunately, most of the factors that impact your resting metabolic rate you have little control over. Genetics, body size, and gender are three major factors. Men tend to have a slightly higher resting metabolic rate than women, although differences in muscle mass may explain some of the difference. Age is another factor. Resting metabolic rate tends to slow with age. These are things you can't change. But, what about things you can?

### Boost Your Metabolism: The Type of Fitness Training You Do

Aerobic exercise is a calorie burner short-term, but strength training is a long-term investment in your metabolism. Muscle tissue is more metabolically active than fat and having more of it on your frame means you expend more energy. Mind you, the difference is modest, but it all adds up. For every pound of muscle you add to your frame, you'll expend an additional 6 calories per day. So, if you build up 12 pounds of muscle, you'll burn an added 72 calories over the course of a day. It doesn't sound like a lot, but over a year, it's not insignificant. Of course, it takes time since women can build, on average, about a pound a month through strength training. So, the calorie-burning benefits are often overstated, but you will modestly boost your resting metabolic rate if you put on substantial muscle

Switching high-intensity interval training for steady-state exercise will also give your metabolism a subtle boost for up to 24 hours afterward (some studies say up to a few days) due to EPOC (excess post-exercise oxygen consumption) or the after-burn effect. However, the spike you get in metabolic rate isn't enormous, but it does add up over time. Don't forget, high-resistance strength training creates an after-burn effect as well. The key is intensity.

### Boost Your Metabolism: Get Your Thyroid Checked

Your thyroid gland, a butterfly-shaped gland, in your neck is the master regulator of your metabolism. If it thyroid function slows, you'll burn fewer calories per day at rest. An underactive thyroid is relatively common in women after the age of 50 and the most common cause is Hashimoto's thyroiditis, an autoimmune condition where your immune system attacks thyroid tissue. It pays to get your thyroid function checked via a blood test, especially after menopause as an under-active thyroid can be treated.

**Boost Your Metabolism: Don't Be an Aggressive Calorie Restrictor**

Aggressive calorie restriction to lose weight can have an unwanted side effect – it can slow your metabolism. Even weight loss itself slows your resting metabolic rate. Your body tries to protect you from starvation. When you're not feeding it properly, it tries to make do with less and the rate that it burns energy slows, a phenomenon called adaptive thermogenesis. Remember, your body is an adaptation machine! Adaptive thermogenesis is one reason most people regain the weight they lose.

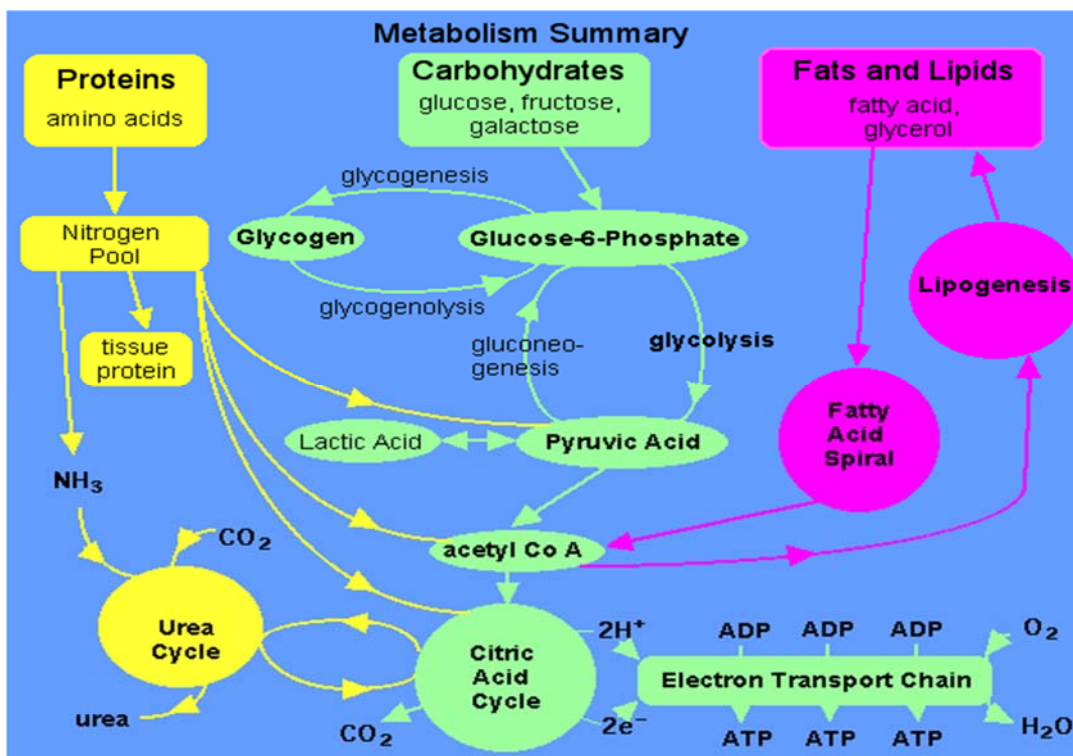
How much does your metabolism slow when you dial back on calorie intake? Losing as little as 5% of your total body weight can reduce your resting metabolic rate by 20%. Studies also suggest that the slowdown in metabolic rate persists as long as a year after an individual loses weight. That's why people are sometimes able to keep the weight they lost off, initially, but it eventually comes back. Strength-training helps you prevent some of the metabolic slowing that goes with dieting as it preserves metabolically active muscle tissue. On the other hand, it's hard to build muscle when you're in a calorie restricted state.

**Boost Your Metabolism: Change the Composition of Your Diet**

It takes more energy to break down, digest, and process protein relative to fat and carbohydrates. So, adding more protein to your diet boosts the number of calories you burn when you eat a meal. As you might expect, this effect is subtle but it all counts. Some past studies suggest that the catechins in green tea modestly boost metabolism. In one study, participants that drank the equivalent of three glasses daily burned an additional 100 additional calories per day. Plus, green tea is a rich source of antioxidants.

**The Bottom Line**

If you're discouraged by the fact that you can't place your metabolism on fast track, heed the wise words of Dr. Chih-Hao Lee, professor of genetics and complex diseases at Harvard's T.H. Chan School of Public Health. He points out that metabolism plays only a minor role in weight gain. Most of it can be blamed on a poor diet and too little physical activity. And, those are things you can do something about. So, take advantage of it!



## 5-MINUTE HEALTHY OATMEAL RECIPE



### INGREDIENTS

- 1 cup rolled oats
- 2 cup unsweetened almond milk
- 1 medium banana, mashed
- 1/2 teaspoon **vanilla extract**
- 1/2 teaspoon **cinnamon**
- pinch of salt

### INSTRUCTIONS

1. Combine all ingredients into a small saucepan and turn heat to medium/high.
2. Bring to a boil. Then, turn heat down to low/medium and continually stir for around 3-5 minutes as the oatmeal cooks and thickens.
3. Once oatmeal is at desired consistency, remove from heat and serve immediately.

# HIIT Workouts Burn Even More Fat When You Add a Jump Rope

If you're looking to push your calorie burning, fat-busting HIIT workouts to the next level, you should start skipping.

Not days in the gym, of course. Just skip out on the weights in favor of one of the most efficient pieces of equipment you probably laying around: the jump rope.

If you haven't picked up a rope since your elementary school days, never fear: This isn't just a kid's toy. The mindless, simple activity of your youth is actually one of the best ways you can take your HIIT workout to the next level.

Skipping rope is one of the most effective cardio exercises around, per a study that found just 10 minutes a day with the rope was comparable to 30 minutes of jogging. Experts tout the activity's benefits as a certifiable full body workout that promotes good heart health, too.

Grown-up skipping is focused on speed and coordination, so leave your slow schoolyard pace behind. Here's a quick explainer on how you should approach your skips.

Add a jump rope to high intensity interval training (HIIT), and you're in for a hell of a workout. It'll be quick, too—you won't have to spend the hours on the treadmill you might have for otherwise similar results. Just don't overdo it. Tackle a HIIT workout about once a week, especially if you're adding onto a weight training program.

Here are two HIIT workouts that use a jump rope and body weight moves that will push your cardio to the next level. Skip as many times as possible using proper form in the allotted time. Repeat each circuit five times.

## 1. The Basic - Easy

**Standard jumps** - 20 seconds

Rest - 10 seconds

**Right foot hops** - 20 seconds

Rest - 10 seconds

**Left foot hops** - 20 seconds

Rest - 10 seconds

**High knee jumps** - 20 seconds

Rest - 10 seconds

**Standard jumps** - 20 seconds

Rest - 10 seconds

**Rest one minute.**

**Total workout time: 17.5 minutes**

## 2. The Jack and Squat - Medium

**Jump rope jacks** - 20 seconds

Rest - 10 seconds

**Body weight squats - 20 seconds**

Rest - 10 seconds

**Side to side jumps - 20 seconds**

Rest - 10 seconds

**Alternating bodyweight lunges - 20 seconds**

Rest - 10 seconds

**Jump rope jack - 20 seconds**

Rest - 10 seconds

**Rest one minute.**

**Total workout time: 17.5 minutes**







Time	Monday	Tuesday	Wednesday	Thursday	Friday
6:15AM-6:45AM	Treadmill Class (No instructor)		Treadmill Class (No instructor)		Treadmill Class (No instructor)
6:30AM-7:30AM	P90X		P90X		P90X
7:00AM- 7:15AM					
10:00AM – 11:00AM	PIYO		PIYO		PIYO
11:00AM- 11:45AM		Cardio (Roxie)	Pump (Roxie or Jenny)	Kickboxing (Roxie)	
11:45AM- 12:00PM		Abdominal Blast (Mike/Roxie)		Abdominal Blast (Mike/Roxie)	
11:45AM- 12:15PM	Treadmill Class (No instructor)		Treadmill Class (No instructor)		Treadmill Class (No instructor)
12:00- 1:00PM	Bootcamp (Jenny)	Pilates (Roxie) BLDG 28 Atrium		Yoga (Rosina) BLDG 28 Atrium	Pilates (Rosina)
4:30PM- 5:00PM	Treadmill Class (No instructor)		Treadmill Class (No instructor)		Treadmill Class (No instructor)
5:30-6:00PM	T25	P90X	T25	P90X	