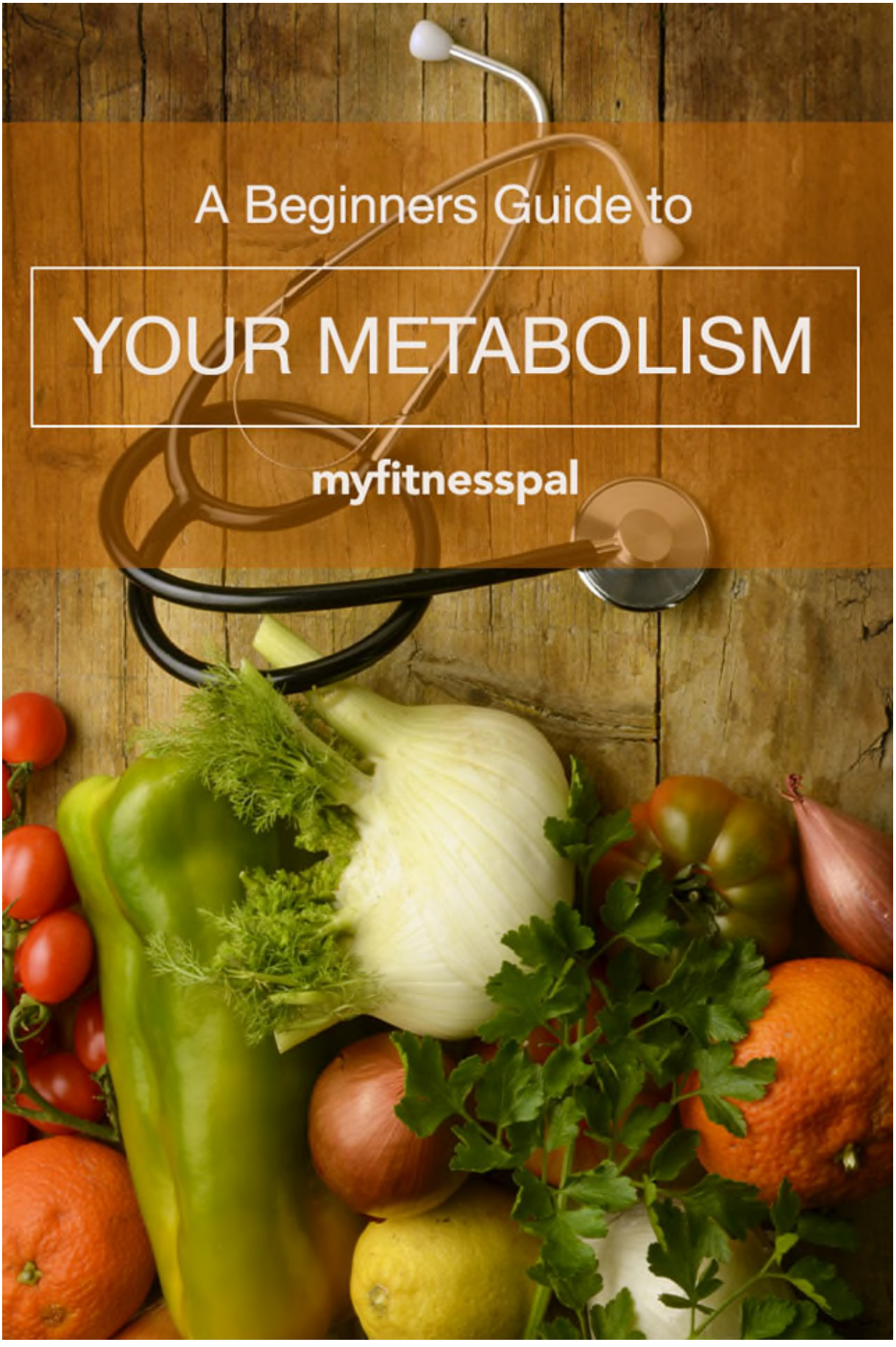
# A Beginner's Guide to Your Metabolism


Contrary to popular belief, the majority of your daily calorie burn doesn't come from puddles of sweat after a tough workout. Calorie burn is actually driven by your metabolism.


A Beginners Guide to
YOUR METABOLISM
myfitnesspal

Metabolism is the entire process of converting calories into energy to power all your bodily processes. And it isn't just about calorie burning! It's also about calorie storing. Your metabolism determines the number of calories you need daily to maintain your weight. While there's only one way calories can enter your body (nom nom!), there are many ways for calories to leave it. Here are the three major factors that affect your metabolism and overall calorie burn.


***Accounts for 60–70% of daily calories you burn.***

Basal metabolic rate is the number of calories your body needs to support the vital functions that keep you alive (breathing, digesting, filtering waste) while at rest. These functions eat up a whopping 60–70% of your daily calorie intake, making BMR the largest contributor to your metabolism. Your BMR doesn't include the calories you burn for normal daily activities or exercise. Here are the key factors that play into BMR:

**BODY SIZE** A bigger individual requires more calories to sustain their body at rest and with any activity they do. Taller and heavier individuals have larger organs (muscles, brain, heart) that require more calories for upkeep.

**BODY COMPOSITION** Muscle is more metabolically active than fat, meaning more calories must be burned to maintain a pound of muscle compared to a pound of fat. Two healthy individuals of the same age, height and weight can have very different BMR if they have significantly different percentages of lean versus fat mass. Since most women have more fat mass compared to men, they have correspondingly lower BMR compared to men of the same height and weight.

**AGE** Your BMR is higher when you are younger, especially since calories are needed to supply your growing body. The trend is that as you age you slowly gain weight in the form of fat mass and lose weight in the form of muscle mass. Read 5 Ways to Cope with a Slowing Metabolism to learn more about how aging affects your metabolism.

**GENETICS** You knew this was coming! Some people are born with higher (or lower) BMR than others, and this is completely normal. Your genes are not something you can fix, but if you suspect you have a genetic condition that slows down your metabolism (such as familial hypothyroidism), this is something you should consult a medical professional about.

**HORMONES** They act like chemical dials allowing your body to turn your metabolism up or down depending on its needs. The two main hormones (thyroxine and triiodothyronine) directly responsible for turning up BMR come from your thyroid gland. Other hormones indirectly cause your thyroid gland to release more or less of these hormones, leading to a change in BMR.

**HEALTH** Generally, your BMR is higher when you are fighting off an infection or healing from a major wound. This is because your body requires more calories to accomplish both of these tasks.

Because these factors introduce so much variability, calculating someone's exact BMR is hard to measure accurately without sinking serious cash into fancy equipment. Instead, BMR is generally approximated using an equation called the Mifflin–St. Jeor, which has been shown to be most accurate in predicting BMR for healthy adults compared to other existing equations. This equation approximates your BMR using your gender, body size and age when it calculates your daily calorie goal. You can even play around with this equation on the MyFitnessPal BMR calculator.

## 2 FOOD THERMOGENESIS: Calories to Digest

***Accounts for 10% of daily calories you burn.***

Sure, it's not an easy word to say, but at least the concept is somewhat simple. Food thermogenesis is the energy (calories) you need to digest and absorb food. Of all the macronutrients, protein requires the most work to digest followed by carbs and fat. About 10% of your daily calorie intake is used to digest and absorb a meal with mixed macronutrients, but here's the breakdown in case you're interested:

- About 0–3% of the calories from the fat you eat are used to support its digestion.
- About 5–10% of the calories from the carbs you eat are used to support its digestion.
- About 20–30% of the calories from the protein you eat are used to support its digestion.

A high-protein, low-carbohydrate diet tries to leverage this phenomenon to burn calories, as it takes more energy to burn protein than carbs or fat. Since food thermogenesis only accounts for 10% of daily calorie burn, eating more protein will only have a small effect on your metabolic rate. While protein is still helpful for weight loss, you need to consider the cons of eating too much, including the wear and tear on your kidneys.

## 3 PHYSICAL ACTIVITY: Calories to Move

***Accounts for 20% of daily calories you burn.***

For most people physical activity accounts for 20% of daily calories burned, but this percentage can be higher on tough workout days. Keep in mind that it's not just about the calories burned while working out; it's also about the calories burned while working on the job (think: typing, carrying heavy loads, standing, fidgeting) and having fun (think: shopping, playing, singing).

MyFitnessPal takes this into account by asking you to identify your usual activity level (sedentary, lightly active, active, very active) to more accurately predict your total daily calorie burn.

**HI-TECH TIP:** If you notice a weight loss plateau, you could be overestimating calorie burn. You can manually change your calorie goal in the app by adjusting your "activity level." Adjusting down to "sedentary" is the lowest you can (and should) go.


Our body is designed to extract energy from all three types of macronutrient fuel (carbohydrates, fat and protein), but that doesn't mean a calorie is just a calorie. What our body is going through while it's burning those calories determines which fuel it turns to the most. Here are some common conditions:

- **Exercise above 70% maximal heart rate:** At this intensity, it's difficult to talk because your body focuses on breathing to deliver oxygen to your exercising muscles. Under lower oxygen conditions, your body turns to carbs for fuel. Why? Because carbs can be burned quickly and it can be used in oxygen-deprived conditions.
- **Exercise below 70% maximal heart rate:** At this intensity, you're able to freely chat with your jogging partner and still get enough oxygen. In this scenario, the body prefers fat as fuel for these activities because this slow-burning fuel is perfect—especially when there's plenty around.
- **Overnight fast:** Your metabolism slows down during sleep, but calories are needed to repair cells and maintain normal bodily functions like breathing. Since you won't be eating for the next 8–12 hours, your body will use fat to fuel most tissues and carbohydrates to fuel your brain. The carb that fuels your brain is glucose, and it's usually stored as glycogen (stored carbs) in your cells. If there's not enough, your blood sugar will drop and protein is pulled in for fuel, because you can convert protein in glucose (a sugar) to bring your blood sugar back up to normal levels.
- **Starvation:** Your metabolism slows way down, making you feel tired and edgy. Protein and fat become the dominant sources of fuel. After 48 hours without food, your body runs out of glycogen to power the two organs that prefer it the most: blood cells and your brain. While glucose is the only fuel blood cells can run on, the brain will start learning to power itself with fat in the form of ketone bodies. Your body ramps up breakdown of muscles and organs (for protein fuel) and fat pads (for fat fuel).

Additionally, certain diseases and conditions will affect the fuel your body uses the most. For example, if you're suffering from a third-degree burn, you'll need much more protein fuel to heal and rebuild tissues.

You can also change the fuel type your body prefers during exercise by training. As you train, your body becomes more efficient at using oxygen during exercise. This allows you to burn more fat during higher-intensity exercises rather than mostly carbs. For this reason, you can perform at a higher intensity (e.g., run, cycle and swim farther and faster) without feeling tired.

**DID YOU KNOW?** Alcohol also provides calories (7 calories per gram, in fact!), but it's not considered a "macronutrient." This is because, unlike the other macros, we do not need alcohol in order to survive.


1. **The "fat-burn" zone on your exercise machine is the best setting for weight loss.** Not necessarily. The "fat-burn" zone on your exercise machine usually operates at a slower pace to keep you at less than 70% of your maximal heart rate. This allows you to burn a larger *percentage* of the calories from fat, but the *number* of calories you burn will be less than if you challenged yourself. Upping the intensity of your workout allows you to burn *more* calories overall, which is helpful for weight loss.
2. **Eating six small meals daily will boost your metabolism.** If the quality and quantity of calories you eat stays constant, eating six small meals instead of three square meals won't boost your metabolism. The pro of this strategy is that it may help you stave off the hunger pangs if you're cutting calories. The con is that it presents you with additional opportunities to overeat.
3. **Thinner individuals have a higher metabolism.** False! Thinner individuals generally have a slower metabolism than heavier individuals. Heavier individuals require more calories to maintain their larger organs.
4. **Late-night eating will mess with your metabolism and cause weight gain.** Your metabolism does ramp down at night, but your body will still handle the food you eat the same way. Again, focusing on calorie quality and quantity is most important.
5. **Drinking green tea will make you burn more calories.** Green tea contains catechins, which supposedly help with fat burning. Several small clinical trials suggest that drinking green tea may benefit weight loss, but the effect is small and the study results were inconsistent. If you like green tea go ahead and brew yourself a batch, but don't count on it for any sizeable metabolic spur.

1. **Squeeze strength training into your exercise routine.** Adding muscle mass increases your BMR, the biggest contributor to your overall metabolism. This will allow you to burn more calories even when you aren't exercising. Check out So You Want to Start...Strength Training to learn more.
2. **Ramp up your workout intensity.** During an aerobic exercise (think: running, swimming, biking), go at a pace fast enough that you can benefit from "after burn," a phenomenon where you burn extra calories after exercise.
3. **Meet your daily protein goal.** High-quality protein sources will give you all the amino acids needed postexercise to help muscles repair and grow. To learn more about how to determine protein needs, check out our Beginner's Guide to Protein.