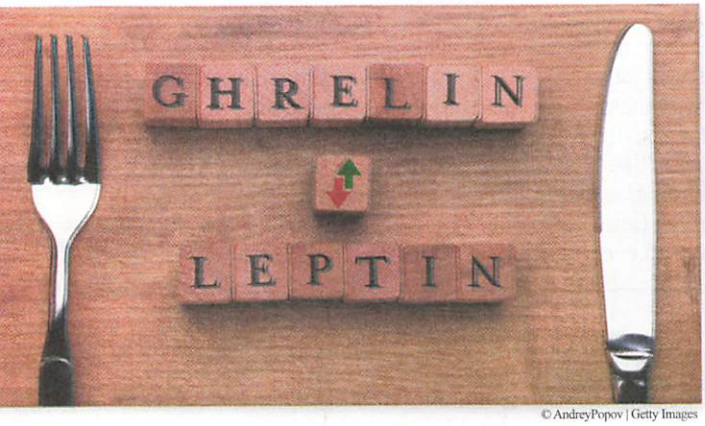
What Drives Your Hunger? A Review of the Hunger Hormones

Helping you understand what you can—and can't—control about hunger.

Do you feel like you are always hungry? It's easy to think you should be able to control, or ignore, your hunger, but that's easier said than done. Your body produces more than a dozen hormones that play roles in promoting or suppressing hunger. Many are produced by your brain, while others originate from other parts of your body. One hormone may activate or block another hormone, and many have additional roles, such as regulating digestion.



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Hunger hormones, like ghrelin and leptin, help the body to regulate levels of hunger and fullness.

When you think of "hunger hormones," leptin and ghrelin might come to mind. Leptin—a satiety hormone produced in our fat tissue—suppresses hunger by signaling the brain that the body has enough stored energy. Levels are highest overnight and are also affected by how long ago you ate and how well you sleep. Ghrelin is produced in the stomach, and levels rise before meals to signal hunger, then fall quickly after eating and stay low for about three hours. Because ghrelin is a "short-acting" hormone, it isn't affected by what you ate yesterday. And if you ignore hunger, ghrelin levels will continue to rise, leading to primal hunger.

Generally speaking, leptin levels are lower in people in thinner bodies and decrease with weight loss. But some people in larger bodies with more fat tissue develop a resistance to leptin's appetite-suppressing effects, which makes weight loss difficult. "Studies have suggested that many people with obesity have a heightened hunger hormone response and a modest satiety hormone response," says Colleen Tewksbury, PhD, MPH, RD, CSOWM, LDN, a spokesperson for the Academy of Nutrition and Dietetics. She said it's not clear how many people experience this, or whether this causes weight gain or happens because of weight gain. "Ghrelin and leptin are only two hormones among many more we are trying to understand. Hunger is like the weather—it is complex. We can predict it relatively well, but we're still learning about its systems and how or if we can control certain parts of it."

Hunger is Normal.

"Hunger is so often thought of as something to be feared or suppressed, but in reality, it is a biological cue that works to keep us alive," says Alissa Rumsey, MS, RD, nutrition therapist and owner of Alissa Rumsey Nutrition and Wellness. She says just as we respond to other signals our body gives us—such as going to the bathroom when we feel the urge to urinate—we need to respond to hunger in the same way, by eating.

Early signs of hunger include an empty feeling in the stomach, or growling sounds. But if you ignored your body's hunger cues—perhaps because you're busy, or simply don't trust that you need to eat—you may become dizzy, lightheaded, or unable to focus or concentrate. You might even feel nauseous or physically ill. "Ideally, you can notice and respond to earlier signs of hunger before you get to this point," Rumsey says.

Mind Over Matter Doesn't Work.

Headlines suggesting that we "trick" or "outsmart" our hunger hormones abound, but Tewksbury says not only is this deceptive—it implies that we have more control over these hormones than we likely do. "When it comes to weight, we often put the responsibility on the individual, saying that they need to 'trick' their body rather than listening to it and learning the best ways for them to work with it," she says. "Fighting nature is difficult. Our bodies aren't built to do it."

While you can't "outsmart" your hunger, you can eat in a way that both honors and manages it. Here are some general tips:

- **Eat breakfast.** Eating breakfast can help stabilize hunger for the entire day. Include some protein, such as eggs or Greek yogurt.
- **Eat on a schedule.** When you go too long without eating, you may become so hungry that you end up overeating. Most people do best with three meals, plus a snack if you go more than about five hours between any two meals.
- **Eat balanced meals and snacks.** When you include protein, carbohydrates, and fat in your meal or snack, you cover your bases, as each of those macronutrients stimulates release of different satiety hormones. Opt for unprocessed carbohydrates rich in fiber or resistant (non-digestible) starch, such as beans, lentils, whole grains, or sweet potatoes.
- **Think volume.** Including water- and fiber-rich fruits and vegetables in your meals boosts nutrition and helps you stay satisfied longer.
- **Get adequate sleep.** Some research suggests that when we short ourselves on sleep, our ghrelin levels will be higher the next day. Most adults need seven or eight hours per night.
- **Engage in regular physical activity.** Not only is this good for your overall health, but it can increase levels of certain satiety hormones and reduce leptin resistance.

That said, no one approach works for everyone. "The best approach is the one that works for you. Your body will tell you, but that means you have to listen to it," Tewksbury says. "Pay attention to what you are doing and ask yourself the important questions: If you were not as hungry yesterday compared to the day before, what was different? Timing? The amount you ate? What you ate? Once you pinpoint the difference, think about how you can use that moving forward." EN

—Carrie Dennett, MPH, RDN

You Should Know

What is Social Jetlag?

Social jetlag can affect several areas of health and well-being.

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To help minimize social jetlag, try to have a consistent bedtime, weekdays and weekends.

We've all experienced the funk of trying to recover from jetlag after crossing different time zones, but what about recuperating from a late-to-bed and late-to-rise weekend? These swings in sleep patterns, that can happen because of extremes in schedules, can negatively impact health.

What is Social Jetlag? Social jetlag is the term used to describe the difference between the midpoint of sleep on weekends and the midpoint of sleep on weeknights. For example, if during the week you fall asleep at 11:00 p.m. and wake at 6:00 a.m., the midpoint is 2:30 a.m. On the weekend, if you fall asleep at midnight and wake at 8:00 a.m., the midpoint is 2:30 a.m. and 4:00 a.m.), or the social jetlag, is one and a half hours. If this is habitual, it's like crossing almost two time zones every weekend!

Disruption of Circadian Rhythms. Light is a regulator of circadian rhythms that not only influences sleep and wake times, but also hormones related to hunger, digestion, metabolism, and waste. Cortisol, growth hormone, and lipid absorption peak in the middle of the night, insulin peaks in early morning hours, and leptin at night. If we're eating when our body's in "storage mode," or not eating when we could, then we're setting ourselves up for negative health consequences. Good sleep is necessary to help optimize our circadian rhythms with eating during the daylight.

Impact on Health. In adults, social jetlag is associated with a higher body mass index (BMI), increase in fat mass, obesity, and obesity-related diseases like metabolic syndrome. In general, as social jetlag increases, people eat more (less healthy) food later in the day and evening.

Researchers are studying whether diet quality and decreasing chronic disease risk can be controlled by focusing on maintaining adequate, stable sleep patterns during the night rather than calorie-counting.

The key is to provide the right behaviors at the right time of day. Dr. Marie-Pierre St-Onge, Director of the Columbia University Irving Medical Center Sleep Center of Excellence, in New York City, New York, provides this advice, "Stick to a regular sleep schedule that allows you to get at least seven hours of sleep at night. This means keeping a consistent bedtime and waketime that does not fluctuate widely between days (or between weeknights and weekend nights). Minimal fluctuation would be keeping to less than 60 minutes between average bedtime on week nights versus weekend nights." EN

—Tamara Schryver, PhD, RD

Spotlight on Supplements: Cinnamon

Cinnamon offers more than just spice.

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Cinnamon may help with diabetes management.

You undoubtedly know the familiar aroma and flavor of cinnamon. This popular spice is used in cuisines around the world for its warm and distinct flavor. But, does cinnamon have therapeutic value? *EN* examines this well-known ingredient.

Overview. Cinnamon is sourced from the inner bark of various species of cinnamon trees. Strips of the bark are dried and rolled into sticks, ground into a powder, or made into an extract. While hundreds of species of cinnamon trees have been identified, Cassia (*Cinnamomum cassia* or *aromaticum*), grown in southeastern Asia is the most common in the U.S. Another species called Ceylon (*Cinnamomum zeylanicum* or *verum*) is native to Sri Lanka and called "true cinnamon" ("verum" is from the Latin for true). Though their taste may be similar, there are differences in chemical composition between species and parts of cinnamon trees. Use of leaves, flowers, and roots in traditional medicine can be traced back thousands of years in China, India, and Iran. It was used for conditions including colds, headaches, and digestive issues. In addition to being a spice, cinnamon is also sold as a supplement in capsules ranging from 500-2,000 milligrams per serving.

Evidence. There are numerous studies examining the effects of cinnamon, especially for people with diabetes. A recent review of 18 clinical trials in people with type 2 diabetes suggested that cinnamon extract supplementation may reduce fasting blood glucose levels. Unfortunately, effects on other outcomes including insulin, hemoglobin A1C, and BMI were not significantly impacted. While these data are promising, cinnamon supplementation shouldn't replace existing treatments and should only be used as an adjunct therapy under medical supervision.

Safety and Side Effects. A 2019 systematic review of short- or long-term cinnamon supplementation concluded that while it is safe as a spice and/or flavor, its use at higher doses or longer durations may be associated with adverse effects. The most frequently reported adverse events were gastrointestinal disorders and allergic reactions. Cassia and Ceylon cinnamon contain a compound called coumarin that may cause liver damage in high doses or in individuals with liver disease.

Interactions. Data is limited for drug interactions with cinnamon at levels typically found in foods. However, higher doses may impact the effect of diabetic medications, antibiotics, and anticoagulants. Please check with your doctor before taking supplements or making significant changes to your diet. EN

—Bridget Cassady, PhD, RDN