



I'm sure you know that you cannot function for long when you are sleep deprived. Sleep can be regarded as the reset button on your computer. When your computer crashes, the surest way to solve the problem is to turn it off. Have we modern day humans have forgotten our intimate connection to sleep? We seem to do everything we can to circumvent it - staying up late into the night watching TV and surfing the Internet, while feeding ourselves under artificial light. In the morning we struggle to wake up, using stimulants like tea, coffee and sugar to "jump start" our bodies and allow us to function once again. Like most things in the modern world, sleep is treated as more of an annoyance than a critically essential process for optimal body function.

Sleep and Hormones

So what can sleep possibly have to do with fat metabolism? Hormones in the body are powerful chemical messengers that tell the body how to respond to the outside world. When most people think of hormones, they think of oestrogen, progesterone, and testosterone. These are definitely examples of hormones, but there are so many different types of signalling molecules in the body that extend way beyond reproduction.

Hormones give the body instructions about how, when and why to respond to the outside world. Some of the major hormones involved in fuel metabolism include: insulin, leptin, cortisol, adrenaline, growth hormone, and thyroid hormone. The relative amounts of these hormones actually tell the body to burn fat or to store fat.

Easily the most important signal received by the body is light. Here is a simplistic description of how light works: as the sun rises, those first beams of light hitting your closed eyelids send signals to the body's nervous system. These signals produce a hormonal response characterized by a slow, steady climb of stress hormones, adrenaline, nor-adrenaline, and cortisol. These hormones then began to raise blood sugar, increase respiration, stimulate fuel metabolism, and elevate energy to wake you from sleep.

The body receives environmental inputs and issues hormonal commands all day long. Food, sounds, light, exercise, stress, and even thoughts provide the stimulus for hormonal reactions that determine whether you burn fat or store it, are insatiably hungry or not, have cravings, enjoy balanced energy, age fast or slow, or maintain a state of health or disease. The power of your choices to impact hormonal balance is profound. Sleep, more than any other choice, has the power to balance your hormonal software for the coming day.

Sleep, the ancient fat regulator

Hormones determine how much and what type of calories will be burned. Most people's bodies are programmed to burn sugar and conserve fat. This is an ancient survival mechanism that evolved to help our ancestors survive periods of famine. For almost all of human existence food was not guaranteed, and those who were able to conserve fat easily fared better. However, there are and always have been environmental signals that told the body to burn fat. Light and sleep are two major such signals.

Why does sleep have this effect? Consider the role light and sleep has played in our evolution as humans. For millions of years we evolved with the seasons. Summer days are longer, brighter, accompanied by abundant food and lead to more fat storage. Winter days have longer nights, colder days, and less food, leading to more sleeping and increased fat-burning. This may seem obvious, but before the artificial light, heat, and readily available processed foods, the only option at night was to sleep.

The problem for modern man is we have unwittingly created an environment that mimics many aspects of summer - we have a constant and steady supply of sugar-rich foods. We keep the temperatures stable through heating and air conditioning. And most importantly, we extend our days and decrease our sleep through exposure to artificial light in the form of TV, computer, and the light bulb. In this "artificial summer", winter never comes, yet we continue to respond as if we were in the natural world of revolving seasons. Leptin, insulin, and cortisol run a hormonal program instructing us to eat as much as we can to get fat for the coming winter. The result? We get fatter, more tired, and often more depressed. Sleep is the way out.

Does science support sleep as a fat burner?

What objective data is there to support this? One study published online at the United States Public Library of Science illustrates how sleep is connected to hormones that control appetite. This study, published in Dec 2004, looked at 1,024 subjects and their sleep and eating habits. In subjects who slept less than 7 to 8 hours a significant increase was noted in body mass index (BMI) and appetite. The study also linked increased levels of leptin and ghrelin, two key hormones regulating appetite, with this finding.

Another study from Jun 2006 bolsters the fact that light and lack of sleep are related to obesity. Published in the International Journal of Obesity, this study found that deficits in sleep were a major predictor of weight gain and obesity. It also showed that heating and air conditioning may be playing a role, lending some support to the idea that human avoidance of natural factors such as light and temperature may lead to "hormonal confusion" as to how to manage our fat stores. The two studies above, and others like them, make the hypothesis of this "artificial summer" not seem as far fetched. Key metabolic hormones involved in fat metabolism are continuously shown to be impacted by sleep deficits.

Choosing sleep

It all starts with your choices - if you are serious about fat loss, you will need to consider some changes in your rest routine. You have to ask yourself what is more important; do you want to burn fat, or watch your favourite Game of Thrones episode?

Frequently people do not feel tired and take that as a sign they should stay up until they can go to sleep. This is the wrong choice. Your body is going to feel like it is summer. Have you ever wondered why people who sit down in front of the TV at night always feel compelled to make their way to the refrigerator? Perhaps it is just habit, but light and other factors are playing a role as well. Feeling tired is no longer a reliable indicator of the need for sleep because everything in the environment is sending the hormonal signal to stay awake. The only way to change this is make different choices.

Technology can help. Using dimmers on your lights and computer screens can decrease stress hormones at night – there are now apps available on your phones to ‘warm’ up the light emitted in the evenings. Using candles is another option. Record your favourite late night TV shows, so you can go to bed closer to sundown.

8 -10 hours is optimal

The body needs long hours of uninterrupted sleep for hormonal balance. Every night your body goes through its rhythm of hormonal repair, regeneration, and revitalization of the tissues of the body.

Time is essential for your body’s hormonal software to download and complete its functions. As the hours pass during sleep, your fat storing hormonal machinery is turned down. Leptin, cortisol, insulin, and adrenaline are lowered. This allows the body to respond to the signals of these hormones once again.

The combination of this hormonal environment signals the body to burn fat. It is important to remember this process takes time. The longer you sleep the better chance you have of enjoying several hours of fat burning. If you sleep less than 8 hours a night you may never reach this “fat burning reset”. Increasing hours of sleep assures maximum fat burning potential.

By 10 pm is best

Your natural sleep cycle is also related to time. Remember, light is what turns on your “hormonal wake-up software”. If you are exposed to light at night you will not be able to easily switch into relaxing sleep. Your physiology is programmed to go to sleep shortly after sundown. The longer you are exposed to light after sundown the more you push back your hormonal sleeping signals.

Parts of these signals include fat burning and anti-aging hormones like HGH, glucagon, and testosterone. With light, these hormones are repressed a bit. So if you sleeping eight hours, but go to bed at midnight, you have only five or so hours of sleep in the dark. This may not be long enough you to reset your hormones and restore some metabolic balance. To ensure your fat burning hormones are working, the time you go to bed may be just as important as how long you sleep.

Turn the lights out

There are things you can do to minimize the effect of light after sundown. Dimmers allow enough light so that you can see, and more closely resemble moonlight than sunlight. Candles create a similar effect. By using dimmers and candles you can help sleep quality and quantity. TVs and computers are equipped with dimmers too.

Don’t eat before bed or at least avoid large amounts of starch/sugar

Sleep is incompatible with eating, so avoid eating just before bedtime. One of the most effective tools for fat loss is the avoidance of food for at least 10-14 hours every night (a variation on

Intermittent Fasting). That means the last meal of the day will need to be around 8pm for most. A night-time fasting regime of avoiding food from 8am to 8pm is one of the most useful things you can do for body change. Staying away from food after the sun goes down helps reverse the hormone resistance of cortisol, insulin, and leptin and makes you a far more efficient fat burner.

By now, we hope you have got the point. Calories, drugs, surgeries, supplements, magic rainforest juice may provide some benefits, but we can't rewrite our ancient hormonal programme. Sleep can. Getting back to sleep is like loading a brand new software program into your body. It tells the body to decrease insulin and leptin. It lowers cortisol and other stress hormones, and it has direct power over fat burning hormones like human growth hormone. Now that you understand how your ability to burn fat is directly impacted by sleep, you can construct an environment that is more in line with your ancient metabolic processes and begin practicing new sleep habits to restore sleep quantity and quality. Sweet dreams!