

## Does your diet influence how well you sleep?

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(TIME.com) -- Poor sleeping habits can lead to overeating, but can unhealthy diets keep you up at night?

Getting enough [sleep](#) and eating right are well-known behaviors for good health. Keeping a balanced diet is one of the best ways to maintain a healthy weight, and those who get seven to eight hours of sleep per night tend to have better health overall.

Previous [studies](#) have linked a lack of sleep to overeating, but less is known about how diet influences sleep patterns.

A group of researchers from the Perelman School of Medicine at the University of Pennsylvania investigated how diets correlated with sleep patterns.

The researchers studied data from the 2007-2008 National Health and Nutrition Examination Survey (NHANES) involving 4,548 people. They looked at how much sleep the participants reported getting each night, as well as a very detailed report of their daily diet.

For the study, very short sleep patterns were defined as less than five hours a night, short sleep was five to six hours a night, standard sleep was seven to eight hours, and long sleep was nine or more hours a night.

[TIME.com: Why sleep deprivation may lead to overeating](#)

It turns out that people in the different sleep categories also had distinct diet patterns. Short sleepers consumed the most calories, followed by normal sleepers, then very short sleepers. Long sleepers consumed the least calories.

Normal sleepers, however, showed the highest food variety in their diets, and very short sleepers had the least variation in what they ate. A varied diet tends to be a marker for good health since it includes multiple sources of nutrients.

Very short sleepers drank less tap water and consumed fewer total carbohydrates and lycopene, found in red and orange-colored fruits and vegetables and high in cancer-fighting antioxidants, than people with other sleep patterns.

Short sleepers tended to eat less vitamin C, tap water and selenium (found in nuts, meat and shellfish) consumption, but more lutein or zeaxanthin, which are found in green, leafy veggies. Long sleep was associated with consuming less theobromine, which is found in chocolate and tea, the saturated fat dodecanoic acid, choline found in eggs and fatty meats and total carbohydrates. Long sleepers also drank more alcohol.

[TIME.com: Losing sleep leads to gains in weight](#)

What do all the correlations mean? As one of the first studies to look into the role that diet plays on sleep quality, the findings are more hypothesis-generating than confirming.

"It was like, 'No one has ever entered this country before, let's go in and take some pictures,'" says study author Michael Grandner, an instructor in psychiatry and member of the Center for Sleep and Circadian Neurobiology at Penn.

Many studies have looked at how sleep influences eating habits. Research suggests sleep deprivation interferes with hunger and satiety hormones crucial to regulating appetite. But the study authors suggest that the relationship works both ways, and that diet can alter sleep as well.

Some of the interactions are well known already, such as how drinking too much water and interrupt sleep by waking you up to use the bathroom, or how consuming heavy and spicy foods can keep you up, but there may be less apparent effects as well.

"For example, iron deficiencies have been linked to restless leg syndrome in some cases. There may be certain substances that work on the molecular level to regulate some of the biological machinery of sleep, but there hasn't been a lot done to tease that apart, and this study may be one of the first to help point us in the right direction of where to look," says Grandner.

[TIME.com: Is social jet lag making you fat?](#)

Further work may clarify whether the relationship is as complicated as short sleep disrupting the body's ability to process calories, or as simple as people who report very short sleep also under reporting the amount they eat.

Still, there is the potential that scientists could one day determine the right mix of calories and nutrients to promote better sleep, which could become a low-cost strategy to curb obesity and heart disease.

"It reminds people that we have come to the point in our society where we recognize that our diet is important to our health. We don't always act on it, but we recognize it," says Grandner.

"We haven't come there with sleep yet. People don't brag about how much they eat anymore -- we used to, but we don't anymore, but we still show off about how little sleep we get."

The study is published in the journal [Appetite](#).

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