

Study explains what triggers those late-night snack cravings

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A study published in the most recent version of the journal *Obesity* found that the body's internal clock, the circadian system, increases hunger and cravings for sweet, starchy and salty foods in the evenings. While the urge to consume more in the evening may have helped our ancestors store energy to survive longer in times of food scarcity, in the current environment of high-calorie food, those late night snacks may result in significant weight gain.

"Of course, there are many factors that affect weight gain, principally [diet](#) and [exercise](#), but the time of eating also has an effect. We found with this study that the internal circadian system also likely plays a role in today's [obesity epidemic](#) because it intensifies hunger at night," said Steven Shea, Ph.D., director for the Center for Research on Occupational and Environmental Toxicology at Oregon Health & Science University and senior author on the study. "People who eat a lot in the evening, especially high-calorie foods and beverages, are more likely to be overweight or obese."

Indeed, eating a lot in the evening can be counterproductive since the human body handles nutrients differently depending on the time of day. For example, sugar tolerance is impaired in the evening. Additionally, consuming more calories in the evening predisposes people to more energy storage; we simply don't expend as much energy after an evening meal in comparison to morning meals.

Furthermore, artificial light enables people to stay up later than they probably should and often people don't get enough sleep. "If you stay up later, during a time when you're hungrier for high-calorie foods, you're more likely to eat during that time," Shea said. "You then store energy and get less sleep, both of which contribute to [weight gain](#)."

"If weight loss is a goal, it's probably better to eat

your larger, higher-calorie meals earlier in the day," said Shea. "Knowing how your body operates will help you make better choices. Going to bed earlier, getting enough sleep and choosing lower-calorie foods rather than higher-calorie foods in the evening can all help with weight loss."

Conducted by Shea and two Boston-area researchers, Frank Scheer, Ph.D. and Christopher Morris, Ph.D. of Brigham and Women's Hospital and Harvard Medical School, the study examined the appetite and food preference of 12 healthy non-obese adults throughout a 13-day laboratory stay in very dim light in which all behaviors were scheduled, including timing of meals and sleep. Dr. Scheer, first author on the study, explained that "by the end of this long protocol, all of the participants' meals and activities were spaced evenly across the day and night, allowing examination of the true internal circadian effects on appetite, while controlling for other effects on appetite including the amount of food recently consumed."

The researchers found that the internal circadian system regulated [hunger](#), with participants feeling the least hungry in the morning (8 a.m.) and most hungry in the evening (8 p.m.). Similar rhythms were found in appetite for types of food, such as sweet, starchy and salty, and the estimate of how much food participants could eat. The study concludes that the internal circadian system causes an evening peak in appetite that may promote larger, higher-calorie meals before the fasting period necessitated by sleep.

"Our study suggests that because of the internal circadian regulation of appetite, we have a natural tendency to skip breakfast in favor of larger meals in the evening. This pattern of food intake across the day is exactly what Sumo wrestlers do to gain weight," said Steven Shea. "So, it seems likely that the internal [circadian system](#) helps with efficient food storage. While this may have been valuable throughout evolution, nowadays it is likely to

contribute to the national epidemic of obesity".

Provided by Oregon Health & Science University

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