

# Later circadian timing of food intake is associated with increased body mass index

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Weight gain and obesity has been described as an epidemic and a complex problem in the United States. Previous research has linked poor diet to weight gain and high body fat, and eating later in the day has also been described as a risk factor for weight gain; however, the impact of an individual's body clock, independent of the time of day of food

consumption, has not been explored.

In a recent study published online in *The American Journal of Clinical Nutrition* (AJCN) on September 6, 2017, BWH investigators examined the relationships between body fat and [body mass index](#), and the timing of [food consumption](#), to time of day and to the body's circadian or [body clock](#). This is the first time that the timing of meals has been studied in real world settings, in relation to melatonin onset, which marks the onset of sleep.

"We found that the timing of [food intake](#) relative to melatonin onset, a marker of a person's biological night, is associated with higher percent body fat and BMI, and not associated with the time of day, amount or composition of [food](#) intake," stated lead author Andrew W. McHill, PhD, researcher with the Division of Sleep and Circadian Disorders at BWH. "These findings suggest that the timing of when you consume calories, relative to your own biological timing may be more important for health than the actual time of day."

Researchers analyzed data collected from 110 college-age participants enrolled in a 30-day observational study to document sleep times and daily meal intake. A mobile phone app was used to time-stamp, document and record the participants' food intake over seven consecutive days of their regular routines. For one night during the 30-day study, participants were studied at the BWH Center for Clinical Investigation to assess the timing of their melatonin onset, marking onset of sleep, and their [body composition](#).

Researchers found that individuals with high body fat percentages consumed most of their calories shortly before going to sleep when melatonin levels were high, compared to individuals with lower percentages of body fat. Researchers note that they were unable to detect a relationship between the clock hour of food intake, caloric amount,

meal composition, activity/exercise level, or sleep duration, and either of these body composition measures. The researchers acknowledged several limitations that need to be considered for future work, including the fact that the population of college-aged individuals may not be representative of the entire population in terms of food choice and circadian or body clock rhythm.

Researchers concluded that these results provide evidence that the consumption of food during the circadian evening/night, independent of more traditional risk factors such as amount or content of food intake and activity level, plays an important role in [body](#) composition.

**More information:** Andrew W McHill et al, Later circadian timing of food intake is associated with increased body fat, *The American Journal of Clinical Nutrition* (2017). [DOI: 10.3945/ajcn.117.161588](https://doi.org/10.3945/ajcn.117.161588)

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