

Maximum Wellness 8.05.2020
Overnight Shift Workers Must Contend with the
Negative Aspects of Their Work

According to research – *Early Morning Food Intake as a Risk Factor for Metabolic Dysregulation* – which appeared in the March 2020 issue of the online journal *Nutrients*, “individuals who begin work in the early morning hours [i.e., between 04:00 and 07:00] make up the largest population of shift workers in the United States.”

It’s also known that overweight and obesity is prevalent among shift workers, which may have to do with elevated fasting insulin resistance – causing the storage of increase visceral (around the abdominal organs) and ectopic (within organ) fat. “It is possible that food intake during the biological night may be a mechanism that contributes to negative metabolic outcomes in this population,” note the Colorado authors of the *Nutrient* research paper.

Increased food intake during the “biological night” - determined by high levels of the hormone melatonin - are the result of altered behavioral sleep and wakefulness schedules – resulting in inadequate sleep and increased food intake, specifically higher carbohydrate intake.

The researchers comment that, “recent studies suggest that the circadian timing of food intake may have a larger impact on body composition than the local clock time of food intake. If sustained, the imbalance resulting from this behavioral pattern, may lead to weight gain over time.”

Mayoclinic.org says melatonin plays a role in sleep. “The production and release of melatonin in the brain is connected to time of day, increasing when it's dark and decreasing when it's light. Melatonin production declines with age,” acknowledges the website.

The Colorado investigators chose to determine the impact of food intake during a simulated early morning shiftwork protocol and its affects on sleep, endogenous (internal) melatonin levels, and metabolic outcomes. The crossover designed study population included twenty-two non-obese, healthy adults.

The participants, who were healthy as assessed by physical, psychological, and sleep disorder screenings and physical exam, blood chemistries, 12-lead clinical electrocardiogram, and urine toxicology, had not participated in shiftwork within

six months or traveled across more than one time zone, within three weeks prior to study.

Each participant's energy content of their diet was established through resting energy expenditure (REE) testing at the medical screening - adding an activity factor that reflected the habitual low level of physical activity. The timing of sleep and food intake were scheduled relative to each participant's normal sleep time to maintain relative consistency.

The participants were scheduled to an 8-hour sleep opportunity at their habitual time. In the early morning shiftwork condition, participants were scheduled to a 6.5-hour sleep opportunity from one hour prior to habitual bedtime, until 2.5 hours prior to habitual wake time.

The current research demonstrated that, "early morning caloric intake after one night of insufficient sleep, when melatonin levels are high, leads to a small increase in glucose levels, when compared to the same meal, after sleeping and awaking at habitual times."

That led to the recommendation of a need, "for future analysis exploring, whether delaying breakfast time, after an early morning awakening may be a potential therapeutic target for improving metabolic health in the largest population of shift workers, and perhaps in modern society for people with high morning melatonin levels for hours after awakening."

