

SUPPLEMENTAL DATA AVAILABLE ONLINE

METHODS

Participants

Participants included 5 Caucasian, 4 African American, and 2 Hispanic individuals. The exclusion criteria were: self-reported sleep problems, night work, variable sleep habits, or habitual daytime naps; physically demanding occupations or regular exercise; depressed mood; excessive intake of alcohol or caffeine; smoking; use of prescription medications or over-the-counter drugs affecting sleep or metabolism; and abnormal findings on history, physical exam, and screening lab work, including a 75-g oral glucose challenge and one night of full polysomnography. Only non-pregnant women were studied and data collection was scheduled during the first half of their menstrual cycle. There were no statistically significant differences in total energy intake and expenditure between the two bedtime conditions when treatment order and baseline body weight were controlled for. The physical activity levels of the participants during each study period were also similar and resembled those of free-living sedentary individuals (21).

Study protocol

The analysis of energy intake and expenditure, physical activity, and changes in body weight and composition during each study condition have been described in detail in a separate report (21). To achieve bedtimes of 5.5 and 8.5h without shifts in circadian phase, the usual lights-off and wakeup times of the subjects were moved proportionally closer together or further apart. Subjects were studied in the controlled environment of the University of Chicago sleep research laboratory, which offers individual accommodations similar to those of a comfortable hotel room with a queen-size bed and has built-in infrastructure for video monitoring and sleep recording. Six subjects started with the 5.5-h bedtime condition and 5 subjects were studied under 8.5-h bedtimes first. Participants spent most waking hours indoors engaged in leisure activities or home-office-type work and had free access to a telephone, desktop

computer, TV, videos, reading material, and the internet. On average, subjects spent no more than 30 min/day outside of the laboratory on the university campus. No naps were allowed and compliance was monitored continuously by our research staff.

Energy intake

During each bedtime condition, subjects received the same customized 3-day meal sequence including typical Western foods on a rotating basis (21). Breakfast was served at 8:00 to 9:00 and included such items as eggs, bacon or sausage; toast, bagel, pancakes or waffles; jelly, peanut butter, or cream cheese; cereal, fruit, yogurt, juice, milk, coffee and tea. Lunch was served at 13:00 to 14:00 and could be a hot or cold entrée (e.g. hot or cold sandwich, pizza, pasta, or meat, a vegetable and starch) along with soup or salad, soft drink, and dessert. Dinner was served at 18:30 to 19:30 and was usually a hot meat, poultry or fish entrée with a vegetable and starch, in addition to salad, non-caffeinated beverage, and dessert. Meals were served in excess to allow *ad lib* intake of energy. In addition, study participants had unlimited access to a snack bar in their room, which was kept stocked with soft drinks and the same individually customized assortment of 10 snacks during each study period. The snacks included salty snacks (e.g. pretzels, chips and dip, cheese and crackers, popcorn, nuts), sweets (e.g. snack bars, muffins, cookies, pudding, ice cream, candy), fresh and dried fruits, yogurt, raw vegetables and dip, and non-caffeinated beverages (e.g. milk, juice, soda, water).