

TIMING OF MEALS and EXERCISE STUDY:

What exactly will be done to me, and what kinds of treatments or procedures will I receive, if I agree to be a research subject in this study?

Preliminary testing. Each subject will have her ventilatory threshold or VT (a measure of aerobic fitness) determined prior to the start of the two experiments in Center for Exercise Research at the Central Campus Recreation Building. This test involves collection of ventilatory and respirometric measurements from the subject during progressive increases in speed (0.64 km/3 minutes) while she walks on a level treadmill and breathes through a mouthpiece. The purpose is to determine the speed at which subject starts hyperventilating (breathing more heavily). This information is then used to assign experimental walking speed at the low intensity of 70% of subject's VT.

Study protocol. On two separate occasions at least one week apart, subjects will arrive at the University of Michigan General Clinical Research Center (GCRC) in the evening prior to the test day. They will be provided a standardized evening meal and will remain in the GCRC overnight. Subjects will be weighed and their body composition measured by bioimpedance. The following morning, a catheter will be inserted into a forearm vein in both arms, one for intermittent collection of blood for hormone determinations and the other to infuse d₅-glycerol to assess the rate of fat mobilization. Assessment of how much fat or carbohydrate is being metabolized will be done by indirect calorimetry before and during exercise, before and after each meal, as well as intermittently throughout the 24 hours.

Exercise protocol will entail walking at a relatively low intensity of 70% of VT one hour in the morning and one hour in the afternoon. The times of exercise will be adjusted to begin either one hour before, or two hours after, the beginning of morning and afternoon meals (breakfast at 08:00 h, dinner at 18:00 h).

Standardized meals. Meals will consist of 63% carbohydrates, 23% fats, and 14% protein. Liquid breakfast will contain 30%, and solid lunch and dinner 30%, and 60% respectively of calories needed to meet the resting energy expenditure and the energy cost of exercise. An evening meal will be given upon admission to GCRC. During study day, daily food will be offered in two larger meals, one at 08:00 h and the other at 18:00 h.

Blood collection and analyses. A blood sample will be collected before, and every 20 minutes during exercise and meals, and every 30 minutes during the hour after meals and exercise. Between 20:00 and 5:00 h the next day, blood samples will be withdrawn hourly. The total volume of blood withdrawn will be 190 ml in each of two experiments (a total of 380 ml or less than one pint of blood).

Indirect respirometry. During exercise, following meals, at hourly intervals during daytime, and one during night, respiratory gases will be collected to determine the type of fuel that is being utilized. During daytime, that will involve breathing through a mouth piece, and at night breathing through a plastic mask placed above the nose and mouth.

COMPENSATION: \$200, \$100 after each blood collection day.