

FLUID BALANCE LAB EXERCISE

Introduction

Every individual has a unique sweat rate, determined by factors such as genetics and training status. Their sweat rate will also vary based on the intensity of a particular exercise, the environment and type of clothing or gear they wear. Conducting a fluid balance test will help an individual determine their unique sweat rate in the environment they are tested. If able, an interesting addition to this lab activity would be to conduct the test with the same individual in two different environments, for example, on a bike in an air-conditioned lab and biking outside on a hot, humid day.

A fluid balance test is conducted by measuring changes in body weight and actively monitoring all fluids consumed and urine output during the testing time. The most accurate results are obtained by obtaining a nude body weight. Since this is rarely practical, individuals are asked to wear minimal clothing, preferably compression shorts and a sports bra for women. The results of this lab exercise will provide fluid needs for the specific environmental and exercise conditions.

Supplemental reading: [SSE #161: Sweat Testing Methodology in the Field: Challenges and Best Practices \(Baker, L. 2016\).](#)

Materials

Body weight scale
Beverage/Food scale
Beverages of choice
Bike, treadmill, or other mode of exercise
Towel
Compression clothing
Digital thermometer
Disposable container for urine collection (if needed) and disposable gloves

Pre-Test Preparation

1. Decide who will be exercising, and who will be conducting the test
2. Decide on an exercise mode. Choose an exercise that can be sustained for at least 30 minutes.
3. Pre-weigh the urine container and record the weight on the data sheet
4. Pre-weigh all beverages the individual expects to consume during the test, if any. Record on the data sheet
5. Ask the subject to void his/her bladder
6. Obtain a pre-exercise body weight wearing minimal clothing, ideally compression shorts (and a sports bra for women). Remove all jewelry. Record on the data sheet.
7. Record the temperature and humidity on the data sheet

8. Begin exercise and record the time.
9. If the subject needs to urinate during the test, have them do so in the pre-weighed container. Weigh and record the weight of the container + urine, record on the data sheet, and discard
10. At the end of exercise, record the time on the data sheet
11. Have the subject dry off as much as possible and obtain a post-exercise body weight, in the exact same clothing as worn for the pre-weight. Record on the data sheet.
12. Record the post-weight of all beverage containers and record on the data sheet.
13. Use the fluid loss calculator at www.gssiweb.org to calculate sweat rate.

Data Analysis

What was your athlete's sweat rate?

Based on a goal of 1% dehydration, how much should your athlete drink in a similar environment to support performance goals?