

Muscular Strength, Power, and Fatigue Lab

Lab Description: Bench press power lab

PURPOSE: to investigate the ability of our muscular system to convert chemical energy to mechanical energy. We will also observe fatigue and recovery rates.

MATERIALS: - weight training equipment including Olympic bar
- 5lb and 2.5lb plates x 10,
- power rack bench press station

OBSERVATIONS:

- ▶ For each participant, record the number of reps at each of the following resistances:
- ▶ Males: 95 – 85 – 75 – 65 – 55 – 45
- ▶ Females: 60 – 55 – 50 – 45 – 40 – 35
- ▶ METHOD: Each participant will perform reps at each resistance until exhaustion, rack the bar, lower the resistance to the next level, and repeat. Last resistance is empty bar.

Hypothesis

- ▶ How will the graphs look as the resistance decreases but the number of reps performed increases?
- ▶ What will be the major difference(s), if any, from one participant to another?
- ▶ Will there be any major difference in the shape of the graph between male and female participants?

Observations

Using the data collected, please complete the following:

- ▶ Calculate and graph the MEAN values for MALES and the MEAN values for FEMALES
- ▶ Graph the results of 10 MALES (use the same axes for all 10) and on a separate set of axes graph the results of 10 FEMALES (use the same axes for all 10)

Discussion Questions

1. Describe (in general terms), the shape of the graph of the results. Does the shape surprise you in any way? Explain your answer.
2. Define “muscle fatigue” (and please cite your source).
3. After defining muscle fatigue, use your definition or at least your research to explain the shape of the graph of the results
4. Define “muscular endurance”. What, if anything, can the results of this lab help us learn about the muscular strength AND endurance of a particular athlete or group of athletes?
5. Create YOUR OWN definition for “muscle recovery”. You may use researched information but please DO NOT quote another source. Cite the sources you use to create your definition.
6. How is the concept of muscle recovery relevant in the exercises performed in this lab?
7. In general terms, how does training for muscular strength affect participation in sport and exercise? How does this differ from training for muscular endurance?
8. Give two examples of sports that value muscular strength while requiring not only different ranges of motion but different recruitment of muscular strength throughout these ranges of motion. Explain the main differences.
9. Briefly outline TWO medical conditions that can affect an athlete’s ability to generate muscular strength
10. State ONE question or area of further study you would like to investigate after completing this lab.