Effect of Load and Afterload on Muscle Response

Experiment 16 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To compare supplied load and afterload records

Principle

A preload is applied before contraction; an afterload is the opposing load during shortening. Load affects the relationship between shortening and work.

Requirements

- Instructor-provided labelled diagrams, traces or data for this activity.
- Calculator, graph paper or spreadsheet, and the activity record.

Procedure

1. Review the record

Use the instructor-provided gastrocnemius-sciatic teaching trace or a simulated recording. Record the axes, gain and input markers.

2. Measure

Identify the load arrangement from the diagram. Compare shortening at each stated load and record work where sufficient data are given.

3. Conclude

Explain the curve using the stated conditions and identify one limitation of the comparison.

Observations and Record

Record item	Entry
Activity / material identifier	_____
Measurement or visible feature	_____
Comparison / calculated outcome	_____
Interpretation and limitation	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- Mechanical work = force × displacement. If force is 0.10 N and shortening is 0.005 m, work = 0.0005 J.

Result

The recorded finding is ____; the supporting observation or calculation is ____. The main limitation is ____.

Precautions

- Use the supplied teaching material; distinguish a measured observation from an assumed value.
- Keep units, axes, labels and measurement conditions consistent.
- Record limitations and seek instructor review before applying a conclusion to a live case.

Viva Questions and Answers

1. What is the main endpoint?

Compare supplied load and afterload records

2. Does one observed result prove a general conclusion?

No. Controls, repeatability and the limitations of the method must be considered.

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