2025 Bi H1 Q9

Section: Metabolism and Survival

Topic: Environmental Control of Metabolism

Question Summary:

An experiment measured the effect of increasing inhibitor concentration on the rate of respiration in yeast by recording CO_2 concentration. You are asked which change to the procedure would improve the **reliability** of the results.

Worked Solution:

- **Reliability** is improved by repeating measurements and looking for a consistent pattern.

Assess each option:
- A: Including a control improves **validity** (comparison), not reliability ✘
- B: Carrying out the experiment **three times at each inhibitor concentration**
→ this produces repeat measurements → improves **reliability** ✔
- C: Using a wider range of concentrations increases the scope of the investigation, but does not improve reliability ✘
- D: Keeping volumes constant controls variables and improves **validity**, not reliability ✘

Therefore, the change that improves reliability is repeating the measurements at each concentration.

Final Answer: B

Revision Tips:

- **Reliability**: repeat the whole experiment or measurements to look for consistency.
- **Validity**: control variables and use appropriate comparisons.
- **Accuracy**: use appropriate instruments and methods to reduce

measurement error.
- CO_2 probes measure respiration rate directly — consistent readings require repeated trials.