

2024 Bi H1 Q15

Section: Metabolism and Survival

Topic: Microbial Growth Phases

Question Summary:

A bacterial growth curve with phases W, X, Y, Z is shown. Which statement correctly identifies a phase and its characteristic?

Worked Solution:

- Typical phases: W = lag (cells adjust; enzymes induced), X = log/exponential (rapid division), Y = stationary (nutrients becoming limiting; rate of division ~ rate of death), Z = death (viable cell count declines).
- Option A: Enzyme induction occurs in lag phase, not log phase -> FALSE.
- Option B: Death phase primarily shows a decline in viable cells; 'total cell count' does not necessarily decrease -> FALSE.
- Option C: Stationary phase occurs as nutrients run out -> TRUE.
- Option D: Secondary metabolites are typically produced in stationary phase, not lag -> FALSE.

Final Answer: **C** (Y is the stationary phase and nutrients are starting to run out).

Revision Tips:

- Lag: enzyme induction; Log: fastest growth; Stationary: nutrient limitation/waste buildup; Death: decline in viable count.

- Secondary metabolites (e.g., antibiotics) often accumulate in stationary phase.