1.Salinity vs. Survival Rate (Direct Correlation)

**Observation**: Survival rate dropped from 87% to 45% when salinity decreased sharply from 29.6 ppt to 10.4 ppt (30ᵗʰ to 45ᵗʰ day).

**Interdependency**: Salinity is critical for osmoregulation in crabs. Sudden drops stress the crabs, reducing survival.

2.Temperature vs. Dissolved Oxygen (Inverse Correlation)

**Observation**: Higher temperatures (e.g., 30.4°C) correlate with stable but lower DO (~5.5 mg/L).

**Interdependency**: Warmer water holds less oxygen, potentially stressing crabs if DO falls below 3 ppm (critical threshold).

3.Ammonia (NH₃) vs. pH (Direct Correlation)

**Observation**: NH₃ spiked to 0.03 mg/L on the 45ᵗʰ day when pH was 7.4 (higher pH increases toxic NH₃ form).

**Interdependency**: Higher pH converts more ammonium (NH₄⁺) to toxic NH₃, risking crab health.

4.Nitrite (NO₂) and Nitrate (NO₃) Stability

**Observation**: NO₂ and NO₃ remained low (0.015–0.03 mg/L) with minor fluctuations.

**Interdependency**: Nitrification (NH₃ → NO₂ → NO₃) was stable, suggesting minimal organic waste buildup.

5.Salinity vs. Growth (Direct Correlation)

**Observation**: ADGR dropped to 0.97 g/day when salinity fell to 10.4 ppt (45ᵗʰ day). Optimal growth occurred at 15–25 ppt.

**Effect of calcium**

**The study investigates how different calcium concentrations in water (200, 300, and 450 mg/L) affect molting dynamics, growth, feeding behavior, and calcium accumulation in tissues of Scylla paramamosain, a commercially valuable species for soft-shell crab production.**

1. **Water Calcium Dynamics**:

* Calcium concentration in water decreased as the number of molting crabs increased,

1. **Molting and Growth**:

* Higher calcium concentrations (300 and 450 mg/L) significantly reduced molting intervals (41.65 ± 5.24 days and 37.70 ± 3.02 days, respectively) compared to 200 mg/L (52.30 ± 2.72 days) (p < 0.05).
* Weight gain and daily weight gain were significantly higher at 300 and 450 mg/L compared to 200 mg/L, attributed to shorter molting intervals.
* The duration of the soft-shell stage decreased with increasing calcium concentration, with low calcium (200 mg/L) prolonging the soft-shell stage, ideal for soft-shell crab harvesting.

1. **Feeding Behavior**:
   * Feeding incidence peaked (~100%) by day 4 post-molt and remained high (>50%) until day 37, with no significant differences across calcium concentrations.
   * Feeding decreased near molting, coinciding with a growth stagnation phase.
2. **Condition Factor**:
   * Crabs reached a consistent condition factor of ~63% across all calcium concentrations, indicating readiness for molting.
   * Time to reach this threshold was similar (37–40 days), but higher calcium levels accelerated molting, ending the stagnation phase sooner.
3. **Calcium Absorption in Tissues**:
   * Calcium content in tissues converged during pre-molt stages, with significant differences post-molt.
   * At 200 mg/L, hemolymph calcium content was significantly lower, indicating reduced calcium transfer efficiency to gills and exoskeleton for calcification.
   * Hepatopancreas calcium was depleted post-molt for exoskeleton hardening, with slower accumulation at 200 mg/L compared to higher concentrations.