

and energy retention are four to five times higher during postmolt than intermolt stages, showing that the biological timing of intake may be as important as feeding frequency itself (Nguyen et al., 2022). Practical feeding management should therefore consider not only how often crabs are fed, but also whether feed quality and feeding time align with the periods of highest assimilation efficiency.

4.3 Survival rate and molting rate

Survival rate is generally less sensitive to feeding frequency than molting or short-term growth. In the 2025 RAS study, feeding frequency had no significant effect on survival, and the once-daily treatment still achieved 100% survival with a molting rate of 0.67 ± 0.58 . Similarly, the 2026 RAS apartment-system trial found no significant differences in survival rate or molting performance among crabs fed one, two, or three times per day (Diatin et al., 2026). These findings suggest that under controlled fattening conditions with acceptable water quality, moderate changes in frequency alone are unlikely to alter survival substantially.

Molting responses appear more context dependent and can improve with higher feeding frequency when crabs are younger or when nutritional stimulation is stronger. In mud crab larvae, feeding rotifers three times daily increased survival above one- and two-time feeding schedules by day 3 and day 4, indicating that frequent food supply is especially important during early developmental stages. In crablets and instars, better feeding conditions are also linked to higher cumulative molting and improved survival, as shown when higher prey density increased cumulative molting and when a more efficiently utilized formulated diet produced both higher survival and higher moulting frequency than minced fish (Thien et al., 2022). Overall, feeding frequency alone does not consistently drive survival and molting in grow-out mud crabs, but it becomes more influential when combined with vulnerable life stages, limited feed access, or nutritionally superior diets. Across these three outcomes, feeding frequency in mud crab culture appears to have stage-dependent effects: it is often neutral in grow-out RAS systems, but more important for larvae, crablets, and periods of high postmolt nutrient demand.

5 Effects of Different Feeding Times on Mud Crab Growth Performance

5.1 Comparison between daytime and nighttime feeding

The evidence on mud crab feeding regimes centers on day-night timing, feeding frequency, and the link between feeding behavior and culture performance. Across the available studies, outcomes differ by life stage and culture system, so the strongest conclusion is not a single universal schedule but a stage-specific feeding strategy. Mud crabs generally show stronger feeding activity under darkness or during the night at juvenile and grow-out stages, which helps explain why many culture protocols include evening meals. Field observations likewise indicate that *Scylla serrata* remains in its burrow until sunset and then spends the night actively feeding, supporting the view that nocturnal behavior is a core ecological trait in older crabs.

This behavioral pattern can translate into culture performance, although the effect depends on lighting regime and developmental stage. In a recirculating system, once-daily feeding at 10 p.m. produced the best numerical growth, molting, and survival values even though feeding frequency overall was not statistically significant (Mayzuri et al., 2025). However, constant darkness is not uniformly beneficial, because juvenile *S. paramamosain* achieved lower final weight and specific growth rate under 0L:24D than under 12L:12D or 18L:6D, indicating that complete darkness can impair grow-out despite the species' nocturnal tendencies.

5.2 Effects of single feeding versus multiple feeding events

The effect of single versus multiple feeding events is mixed, with larval studies tending to favor more frequent feeding, while juvenile and fattening studies often find little difference in growth across schedules. In *S. olivacea* larvae, feeding rotifers three times daily improved survival on days 3 and 4 and produced greater absolute growth by day 6 than one or two feedings per day (Pattirane et al., 2022). This pattern is biologically plausible because larval feeding strategy is constrained by short gut evacuation and digestion times, making repeated feed delivery more compatible with continuous energy demand during early development.