

4 Effects of Different Feeding Strategies on the Growth Performance of Pacific White Shrimp

4.1 Effects on weight gain and specific growth rate

Feeding rate and rationing strategy have clear impacts on weight gain and specific growth rate (SGR) of Pacific white shrimp. In high-density biofloc systems, increasing feeding rates above a reduced baseline progressively increased final weight and weekly growth, but gains tended to plateau as rates exceeded the level needed to approach maximum growth. Similarly, in biofloc grow-out systems, a moderate 25% reduction in feeding rate unexpectedly produced the highest final weight, biomass, and weight gain, indicating that natural food sources can compensate for reduced formulated feed while still supporting rapid growth and high SGR (Kusmiatun et al., 2025).

Feeding frequency and delivery method also shape weight gain and SGR, even when the total daily ration is similar. In ponds, increasing daily feedings from two to six times using timer or acoustic demand systems significantly raised final individual weights compared with twice-daily protocols, showing that distributing feed more evenly enhances growth performance. Recirculating tank trials with automatic feeders further highlight that feeding 6-8 times per day optimizes final body weight and SGR compared with both lower-frequency manual feeding and higher-frequency automatic schedules, suggesting that there is an optimal feeding frequency window beyond which additional meals do not improve, and may even impair, growth (Liang et al., 2025) (Figure 2).

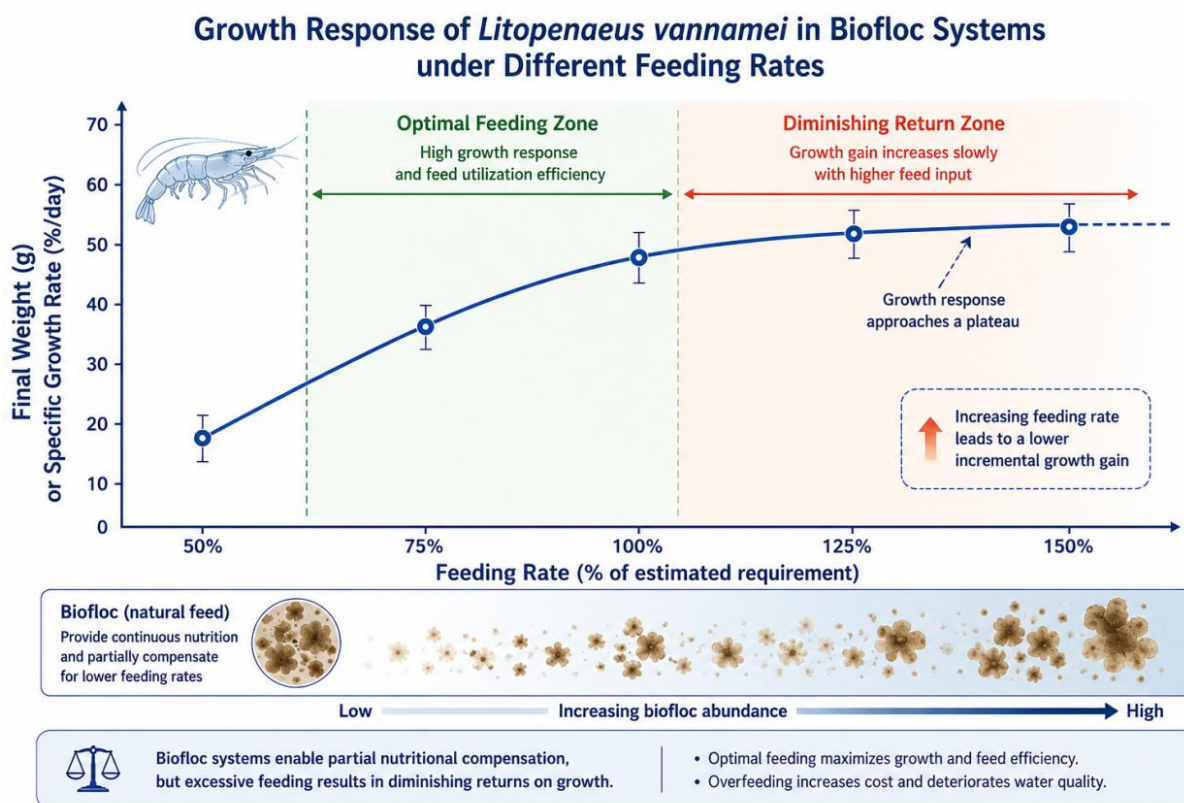


Figure 2 Conceptual relationship between feeding rate and growth performance of Pacific white shrimp (*Litopenaeus vannamei*) cultured in biofloc systems

4.2 Effects on survival rate and culture duration

Many feeding strategies that alter ration level or delivery pattern can maintain high survival while modifying growth trajectories, which has implications for culture duration. In intensive biofloc systems exposed to a wide range of feeding rates, survival remained consistently high (around 94%-97%) across treatments, indicating that shrimp tolerate substantial variation in feed inputs over a 63-day cycle without major mortality effects. Nursery-phase biofloc studies similarly reported no significant differences in survival or feed conversion ratio when feeding frequency was reduced from six to one meal per day over 40 days, suggesting that survival in early nursery stages is relatively robust to feeding frequency adjustments under good water quality (Wasielesky et al., 2020).