

Research Insight

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Effects of Different Feeding Regimes on Growth Performance of Mud Crab

Haimei Wang ✉

Hainan Institute of Biotechnology, Haikou, 570206, Hainan, China

✉ Corresponding author: haimei.wang@hibio.org

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Abstract Feeding management is one of the most important factors influencing the growth performance, feed utilization, and economic efficiency of mud crab (*Scylla* spp.) aquaculture. This paper reviews the effects of different feeding regimes on mud crab growth performance by examining feeding frequency, feeding time, feeding level, feed type, and feeding strategy. Mud crabs exhibit unique growth characteristics associated with molting, which require precise nutritional support and feeding management. Appropriate feeding frequencies and multiple daily feeding events can improve weight gain, specific growth rate, feed conversion efficiency, and survival rate by enhancing feed intake and reducing nutrient loss. Feeding time also affects feeding behavior, with nighttime feeding generally showing advantages due to the nocturnal feeding habits of mud crabs. In addition, suitable feeding levels promote optimal growth and economic returns, whereas overfeeding and underfeeding may negatively affect water quality, feed efficiency, and crab health. The interaction between feed types and feeding strategies further influences production outcomes, with integrated approaches combining formulated feeds and fresh feeds often providing superior results. Case studies demonstrate that scheduled feeding, high-frequency low-quantity feeding, and intelligent precision-feeding systems can significantly enhance culture performance. Future research should focus on precision feeding technologies, automated monitoring systems, and sustainable feeding strategies to improve productivity and environmental sustainability in mud crab aquaculture.

Keywords Mud crab; Feeding regime; Growth performance; Feed utilization; Precision aquaculture

1 Introduction

Mud crab aquaculture has become an economically important coastal activity, and research increasingly treats feeding management as a central determinant of production efficiency, survival, and sustainability. *Scylla* species are among the most valuable commercially farmed crabs, with strong live-market demand across the Indo-Pacific and expanding trade in Asia and elsewhere (Paran et al., 2022). At the same time, the industry remains heterogeneous and only partly industrialized, spanning hatchery- and wild-sourced seed, extensive to intensive systems, and culture environments ranging from mangrove areas and ponds to cages and recirculating systems. This flexibility has helped the sector expand substantially in response to market demand and improvements in hatchery and grow-out technologies, especially across Southeast Asia, while also supporting food security, rural income, and broader coastal development (Diamahesa and Rahmadani, 2024). However, mud crab farming still faces persistent constraints, including dependence on wild seed, habitat degradation, disease risk, high production costs, and uneven technological adoption, all of which limit stable long-term growth. In some production regions, aquaculture still contributes only a small share of market supply, as shown in Bangladesh where about 95% of exportable crab reportedly comes from natural sources, underscoring the need for stronger nursery, hatchery, and farm-level innovations. Similar development tensions appear in East Africa and Kenya, where rising export demand, declining wild crab size, and pressure on mangrove ecosystems have driven interest in small-scale culture and silvofisheries as alternatives to capture-based supply. Even where the industry is profitable and technically straightforward, sustainable growth depends on improving seed production, feeding practices, and production management rather than continued reliance on wild resources alone.

Within this broader development context, feeding management is one of the most decisive operational factors in mud crab culture because it directly shapes growth rate, molting success, survival, feed conversion, water quality, and production cost. A recent synthesis of mud crab farming studies concludes that feed type, rearing system, and