Optimizing heterotrophic feeding rates of three commercially important scleractinian corals

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PII: S0044-8486(17)31700-3
DOI: doi:10.1016/j.aquaculture.2017.10.013
Reference: AQUA 632867

To appear in: *aquaculture*

Received date: 23 August 2017
Revised date: 11 October 2017
Accepted date: 12 October 2017

Please cite this article as: Alejandro Tagliafico, Salomé Rangel, Brendan Kelaher, Leslie Christidis , Optimizing heterotrophic feeding rates of three commercially important scleractinian corals. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Aqua(2017), doi:10.1016/j.aquaculture.2017.10.013

Optimizing heterotrophic feeding rates of three commercially important scleractinian corals.

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ABSTRACT

Heterotrophy plays an important role in improving coral growth rate in aquaculture. While a lack of sufficient food will reduce growth and delay production timelines, excessive food deteriorates water quality and represents an additional production cost without benefit. Currently, there is limited information related to the maximum feeding rates of corals. Using the curvilinear Michaelis-Menten model with six different concentrations of *Artemia* during day and night feeding, we estimated the maximum feeding rates for *Acropora millepora* (4.6 ind cm^{-2} h^{-1}), *Hydnophora rigida* (20.4 ind cm^{-2} h^{-1}) and *Duncanopsammia axifuga* (22.8 ind $polyp^{-1}$ h^{-1}) and the necessary concentrations of food to reach the maximum levels of feeding. Overall, the three species increased their feeding rates with increasing *Artemia* densities until the concentration reached 120 ind ml^{-1}, after which there was no change to feeding rate. No significant differences were detected between day and night feeding rates in any of the three corals species. We demonstrate that the concentration to reach the maximum *Artemia* feeding rates for these commercially important coral species was above 50 ind ml^{-1}.

Keywords: Acropora millepora; *Hydnophora rigida; Duncanopsammia axifuga*; feeding rate; aquarium trade; coral aquaculture