

**Title:** Changes in Female Humpback Whale (*Megaptera novaeangliae*) Surface Feeding Behavior Through Stages of Maternal Care and Reproduction

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North Atlantic Humpback Whales (*Megaptera novaeangliae*) are a solitary species that are found on their major feeding ground Stellwagen Bank Marine Sanctuary from March to November each year. Humpback whales in this region display five different feeding behaviors, including kick feeding, group feeding, bubble feeding, lunge feeding. Based on these behaviors it was observed that there are differences in feeding behavior between females that have a calf and females that do not have a calf, especially in group feeding. In this study we sought to determine if pregnancy or the presence of a calf influenced group and individual feeding behavior in female Humpback whales. Observational data on the Humpback whales was collected from March until November over a period of four years aboard four-hour commercial whale watch vessels leaving Boston, Massachusetts. Collected data was then analyzed to determine the frequency of the five types of feeding behavior displayed by the female Humpback whales over the four year period using Student T-Test and ANOVAs. This allowed determination of the changes in surface feeding behaviors during the different stages of maternal reproduction and care. We found that feeding behaviors among pregnant females decreased significantly while pregnant and while caring for their calf compared to the years prior to their pregnancy and calf, and increased again in the year post-calf. Considering the limited support female Humpback whales have as a solitary species, these results are helpful to understanding the behavioral changes that occur in these whales and can help enhance our perception of behavioral adaptations to reproduction and maternal care. Additionally, research of the distribution of feeding behavior in pregnant females might increase our understanding of general behavior of mother/calf pairs in complex solitary social dynamics.

**A list of keywords (10 maximum):** Humpback whales, feeding behaviors, maternal care, pregnancy, reproduction,