

Ref.#: Ma_47
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ABSTRACT

The role of lipids and fatty acid composition for successful reproduction in *Calanus glacialis*

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Calanus glacialis are mixed breeders, being able to utilize both internal and external resources for reproduction. To document this behavior, we incubated females without food from January to May and compared the reproductive outcome with females incubated under sur plus feeding conditions. Parallel with the laboratory incubations, field studies were conducted to follow maturation and egg production. Both treatments produced eggs and viable nauplii, but for the fed females the outcome was higher both in terms of number of eggs produced and percent of eggs hatched. The consumption of stored lipids, investment in offspring and fatty acid composition of females and offspring were also compared. The stored lipids decreased even when food was available, both in lab and field, suggesting that the females did not utilize only the food. The depletion of stored fat was most rapid prior to first egg production, at the time of maturation of the gonads, and this process appears to rely mostly on fatty acids the females are capable of synthesizing *de novo*. When food was scarce, the females produced fewer but more lipid rich eggs as opposed to more eggs with less lipids in each egg when food was abundant. Suggesting a reproductive strategy not previously described for *Calanus glacialis*. The fatty acid composition is more important than total lipid content for the hatching success of the eggs, and 16:0, 18:0, 20:5(n-3) and 22:6(n-3) seems to be particularly important. The fatty acid composition of the females changed throughout the winter-spring transition, and the changes seems to be related to where in the reproductive cycle they are.