Copepods are used as feed for marine finfish larvae, containing high values of protein and essential fatty acids. Selective breeding is a powerful tool to increase the performance of a population for desirable traits. For copepods, fecundity is one main trait to select for. Heritability estimates 0.38 for egg production rates in the copepod *Paravocalanus crassirostri* have been reported. Increasing the average reproductive output of the broodstock will result in higher egg production while production inputs such as microalgae, labour cost and equipment would remain unchanged.

In order to explore the potential of breeding to increase the egg production of female copepods, a selection program was initiated that systematically measured daily egg production for *Acartia Tonsa* females from CFEED, individually, over 7 days. Females with the highest average daily production of eggs were then selected for crossing into the next generation via a partitioned mass spawn design. Subsequent generations were reared in a similar fashion, selecting females at random from the mass spawned pool of juvenile copepods.

Initial results suggest that selection for fecundity produced rapid changes in the mean egg production of copepods between generations. The extent to which these substantial gains can continue to be improved at this rate remains to be determined, as well as whether increased egg production is a physiological trait with trade-offs in other performance metrics. Nevertheless, these findings suggest that selective breeding could be a valuable tool to increase the efficiency of commercial copepod farming. After several generations, egg production traits will be compared to an unselected population of copepods in a common environment to evaluate estimates of genetic gain.