

Rearing Yellowtail Kingfish: Focusing on Live Feeds

In an Australian Seafood CRC project that could greatly improve yellowtail kingfish (YTK) fingerling production, researchers are improving the performance and growth of high quality hatchery reared fingerlings.

The project 'Improvements in yellowtail kingfish larval and juvenile survival and quality', has recently completed two trials at the South Australian Aquatic Science Centre, focused on the timing and levels of live feed supplied by rearing protocols thought to potentially effect the growth, survival and the level of jaw deformities in larvae.

The first trial investigated the rotifer feeding phase from 2 until 12 days post hatch (DPH). With rotifers being the first feed following the absorption of the yolk sac, this phase is critical in establishing and maintaining healthy larvae.

Two different approaches to rotifer feeding were considered: i) maintaining a set level of rotifer densities from the start of feeding; and ii) progressively increasing rotifer densities during culture. Different densities within both methods were assessed.



MISA researcher, Dr Bennan Chen examines YTK larval tanks.

The survival rate of larvae was shown to be affected by the different treatments, while no differences in growth were detected. The treatments that had the highest survival had high rotifer densities during the early days of feeding, suggesting that it was important to maintain a relatively high rotifer density from the onset of first feeding. The level of jaw deformities, as assessed by the Tasmanian Aquaculture and Fisheries Institute (TAFI), was low and was not affected by the different treatments.

A second trial looked at the co-feeding of rotifers and *Artemia* from 12 until 21 DPH. The transition to *Artemia*, the final live feed stage, is also known to be important stage effecting the growth and survival of larvae.

This trial considered two main approaches to co-feeding: i) progressively increasing *Artemia* densities to a set level while reducing rotifer densities to zero; ii) progressively increasing *Artemia* densities to a set level, while maintaining a reduced density of rotifers. Different densities of *Artemia* were assessed within both methods. A control treatment of rotifers only was also included.

Again, the survival of larvae was shown to be affected by the different treatments, while there were no differences in growth. Results suggest that there was no benefit in continuing rotifer feeding for prolonged periods after the introduction of *Artemia* and that feeding rotifers exclusively throughout this period was detrimental to larval survival. Medium densities of *Artemia* resulted in the highest survival. It is not yet known whether the level of jaw deformities was affected by treatments (analysis currently under way at TAFI).

These results demonstrate that there are opportunities to significantly increase survival of YTK through improving feeding protocols for live feeds. Results also show that there are opportunities to simplify these protocols. Combined, this suggests that commercial YTK hatchery production can be increased and fingerling costs reduced.

Previous research on the development of the YTK digestive system suggests that they may be able to accept *Artemia* from as early as 8 DPH and digest inert diet from 15 DPH once they develop a fully functioning stomach. Further studies looking at introducing *Artemia* and inert diets earlier could also lead to further improvements in the rearing of YTK larvae.

Please note that this work is Commercial In Confidence and so specific results from experiments could not be disclosed.

Key Points

- The timing and levels of live feeds supplied during yellowtail kingfish (YTK) rearing was investigated.
- Rotifer treatments affected survival of larvae, but not growth or levels of jaw deformities.
- High survival was achieved using high rotifer densities during early stages of larval rearing.
- *Artemia* feeding treatments affected larval survival, but not growth.
- There was no benefit in prolonged feeding of rotifers after the introduction of *Artemia*.
- Medium densities of *Artemia* resulted in the highest survival.
- There are opportunities to improve hatchery production and reduce costs through improved live feed protocols.

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For full details on the project and related publications please visit:

www.misa.net.au

