Intensive Walleye Larval System

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Walleye Larval Stage

Key Points:

- Size: 6-9mm sac fry
- Photopositive Behavior
- 3-5 days to exogenous feeding
- Cannibalism starts at exogenous stage
- Key for Initial Survival: Feed Acceptance & Gas Bladder Inflation
Size Comparison
Atlantic Salmon
Arctic Char
Walleye
Photopositive Activity
➢ Photopositive Activity
1-4 days of endogenous feeding (yolk sac absorption)

- Mouth closed, not yet developed, initial yolk absorption stage
3-5 days to exogenous feeding

➢ Intestinal tract developed, feed acceptance
➢ Cannibalism starts at exogenous stage (Generally 50% unobserved mortality)
Key for Initial Survival:
1. Feed Acceptance & Gas Bladder Inflation
Fig. 11.2 Photographic (left) sequence from microvideography (From Rieger and Summerfelt 1998) of Walleye larva (prolarva I) penetrating the water surface to gulp air: (a) larva approach surface; (b) pushes against surface film with rapid movements of the caudal fin; (c) larva at instant of penetration; (d) larva following penetration, tail movement stopped and the larva was momentarily suspended by the surface tension for 0.5 s. Artistic representation (right) of the larvae penetrating water surface to gulp air: third fish in upper right has gulped an air bubble, and lower right illustrates surface film folding into the fish’s mouth.
Gas Bladder Inflation
(Interval: 5-12 days post hatch)
➢ No inflation of gas bladder
No inflation of gas bladder: Increased deformities, poor swimming ability, slower growth & cannibalism
Yellow Perch Project

Spinal deformities may correlate no inflation of gas bladder
Intensive Walleye Larval System

- Designed with key points in mind
- Utilized for Feed Training
- 8-10 man hours daily
- In system for 30-40 days
Intensive Rearing

Why?

➢ Better Monitoring & Control
➢ Commercial Formulated Feed (Quantity & Quality)
➢ Increased Growth & Survival
➢ Manipulation of Growth for Production Schedules
➢ Utilize Out of Season Spawning of Brood
➢ Market for Intensive, Feed Trained Fish
1. Turbid Water
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   - Limits clinging behavior
   - Limits Cannibalism
   - Better Feed Acceptance
Tank Color

➢ Black Walls & Gray Bottom
➢ Works with Turbidity to Disperse Fry
Larval Tanks

Key Points

2. 24 hour feeders
Oliveye fry growth 2015

Days in Larval Rearing System
Larval Tanks

Key Points

3. Spray Bar
3. Spray Bar
- Keeps Surface Clean
- Improves Gas Bladder inflation
Larval Tanks

Key Points

4. Rotational Inflow
➢ Reduce Cannibalism
➢ Maintain consistent water quality & feed
Larval Tanks

Key Points

5. Center Screen & Stand pipe
Center Screen & Stand pipe

➢ Screen is removable to be cleaned daily
➢ Screen has increased surface area for water flow
➢ Stand pipe controls water level
Three various screen sizes used in the larval tanks as the fish grow beginning with 400 micron to 1000 micron and ending with 2mm
Larval Tanks

Key Points

6. Overhead Dimmable Lighting
Lights remain dim unless cleaning tanks when fry are photopositive.
In Summary: Intensive Larval Rearing
- Focus on the Biology of the Species being reared.
- Technological advancements for intensive systems - Formulated feed, management, equipment & design.
- Improved species/strains for intensive rearing.
- Not all species are fit for intensive culture…