

Effects of Alternative Food Types on Larval Lake Sturgeon (*Acipenser fulvescens*) Body Size and Survival

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Left: Jenna Ruzich with Age-0 lake sturgeon produced from gametes collected from adults captured in the Black River, Michigan

Right: Section of experimental 3L tank set-up (Family 1 on top, family 2 on bottom)

INTRODUCTION

Raising fish such as Lake Sturgeon in a stream side facility requires extensive manpower and resources for growth and survival. Rearing larval Lake Sturgeon can be costly depending on diet types and feeding schedules; usually requiring multiple feedings per day. Larvae are typically fed live brine shrimp (*Artemia*), which is expensive and requires multiple cultures and harvests per day. Therefore, the objective of this study was to identify alternate food types that may reduce the costs and labor associated with raising larval Lake Sturgeon.

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Recording weight measurement of one experimental tank unit containing approx. 20 fish

METHODS

- Study site was the Black River Stream-side Research Facility
- Conducted late May 2015 – end of June 2015
- Live brine shrimp, frozen (thawed) brine shrimp, decapsulated brine shrimp eggs, and a 50/50 mix of frozen brine and decapsulated eggs were used as experimental treatments

Experimental Treatments

- Two families for each treatment (1: 208x216, 2: 218x212)
- Four treatments; 4 replicates for each treatment
- Families raised separately
- Sixteen 3L tanks used for each family
- Twenty fish per tank
- Tanks placed in randomized order within family
- Experiment conducted for 3 weeks

Feeding Rate

- 26% body weight (week 1), 26% (week 2), 13% (week 3) (Similar to Deng et al. 2003)
- Fish were fed three times per day at 9am, 1pm, and 5pm
- Fish were weighed at the end of each week by tank
- Average weight used to determine following week's food amount

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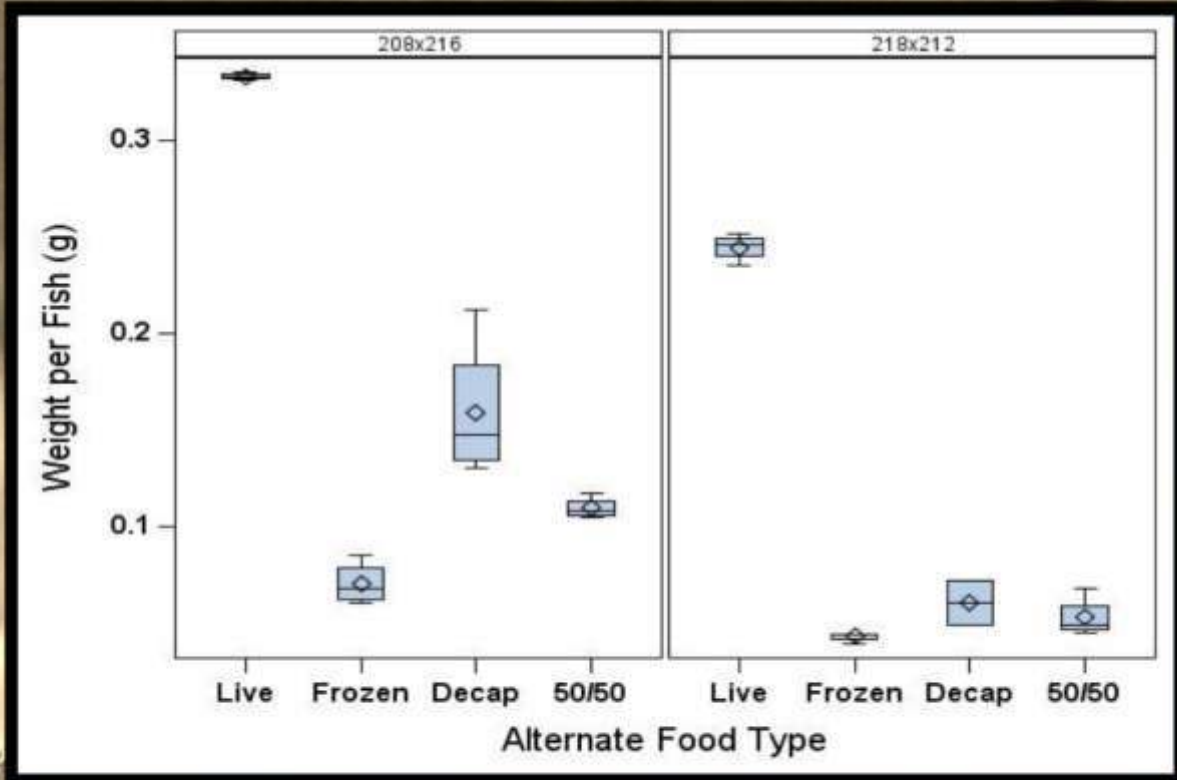


Figure 1: Mean weight (g) as a function of alternate food types at the end of week 3 (21 days) separated by family.

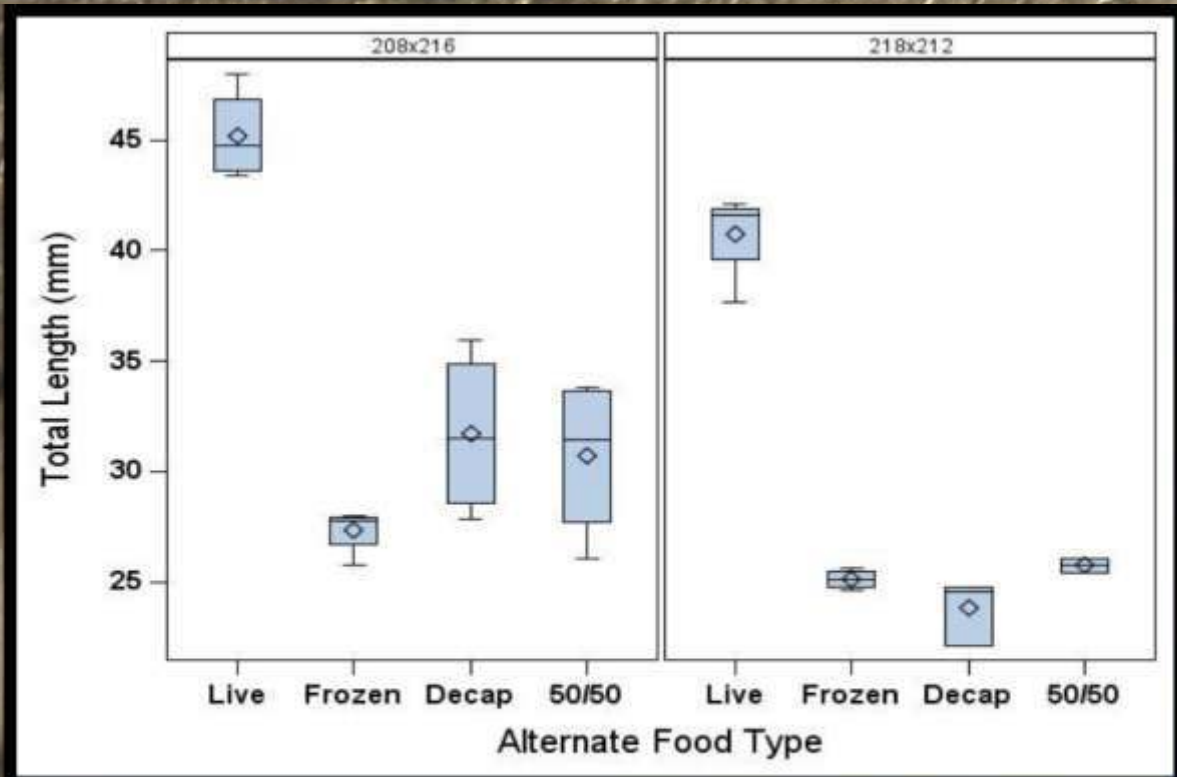


Figure 2: Mean total length (mm) as a function of alternate food type at the end of week 3 (21 days) separated by family.

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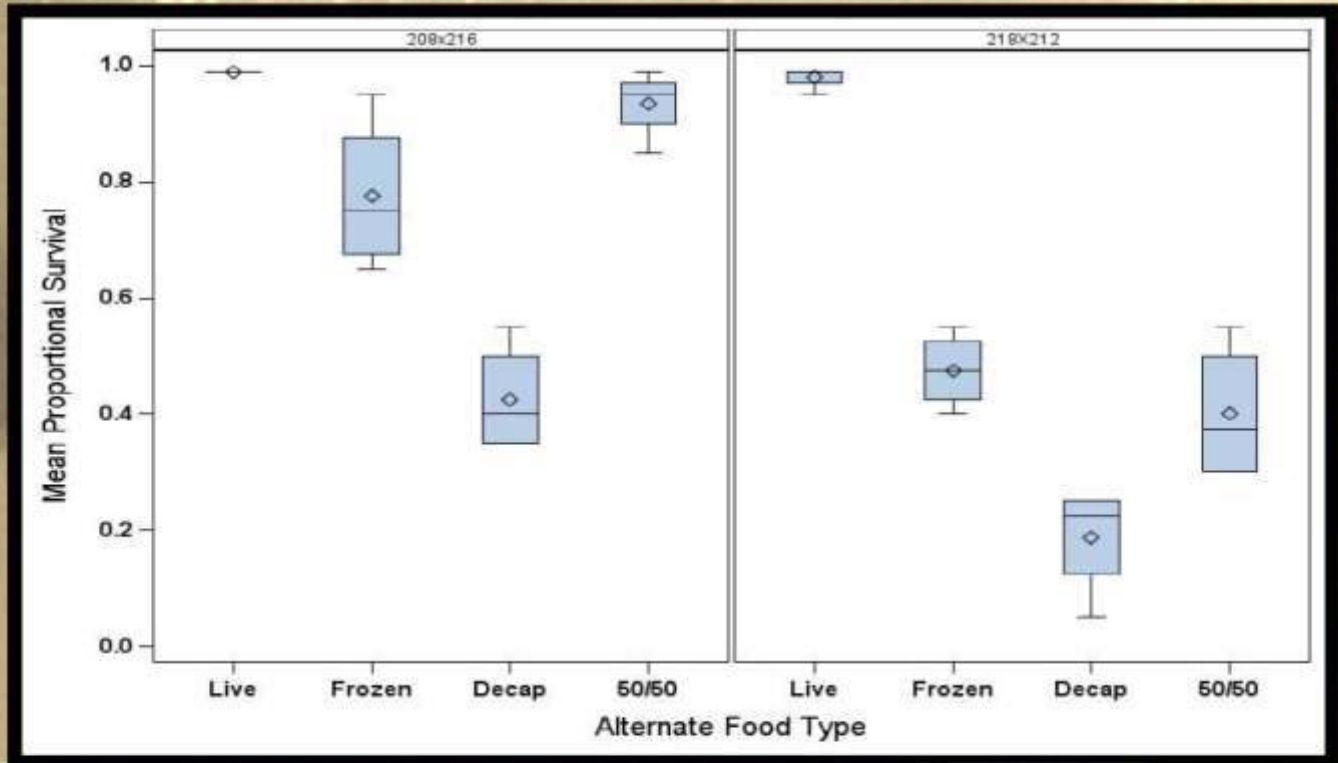


Figure 3: Mean proportional survival as a function of alternate food type at the end of week 3 (21 days) separated by family.



Left: Tank containing frozen brine shrimp diet larvae (L) and live brine shrimp diet larvae (R)
Right: Net containing larvae at the end of week 3 (day 21) fed live brine shrimp diet

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DISCUSSION

Mean weight per fish and total length (TL) in two families of larval Lake Sturgeon was significantly higher for groups fed live brine shrimp (LBS) compared to those fed other diet types. These results could indicate that larval Lake Sturgeon favor live brine shrimp over other food types.

Mean proportional survival of lake sturgeon from two families was significantly higher in groups fed LBS compared to those tanks fed other food types. Higher survival of live brine shrimp fed larvae shows that these larvae may be better able to withstand handling stress, temperature changes, and other environmental changes. Fish fed other diet types could have starved to death from not eating enough or were unable to deal with stressors.

Differences among families were observed for TL and survival. Family divergence could have resulted from a difference in flow rates among tank rows during the first week of the experiment.

A closer inspection of the data may suggest that larval Lake Sturgeon prefer live food. This could possibly be attributed to a vibratory response that elicits initiation of feeding.

Further research is necessary to investigate alternate 'live' food types that may decrease rearing and labor costs without compromising aquaculture production goals and fish quality.



Thirty-two 3L tank set-up at the Black River sturgeon rearing facility

ACKNOWLEDGEMENTS

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