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Technical Report No. 76-5

August, 1976

FECUNDITY OF HATCHERY-REARED LAKE TROUT
IN RELATION TO FOOD AVAILABILITY

Richard M. Poynter, Hatchery Biologist

SUMMARY

The fecundity of hatchery-reared lake trout appears to be directly related to food availability. Fish fed at a daily rate equal to 0.75% of their body weight, produced more eggs per fish and these eggs were larger and fertility was greater when compared with eggs from fish fed at a daily rate of 0.5% of their body weight.

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INTRODUCTION

Due to an increasing cost of fish food and the large amount of food consumed by broodfish during their lifetime, this study was initiated on April 18, 1974 in an effort to determine an adequate feeding level for mature female lake trout broodstock. Equal numbers of fish were placed in two ponds of equal size. Daily feeding rates of 0.5 and 0.75% of the weight of fish were selected for evaluation. Both groups of fish were fed twice daily, six days per week.

Fecundity of fish and fertility of eggs were selected as the major criteria for evaluation.

RESULTS

As shown in Table 1, there was a marked difference in the number of eggs produced by the fish on the two feeding levels. Not only did the higher feeding level produce more eggs, but those eggs were also larger.

Table 1.--Egg production of lake trout fed at two rates

Feeding level	Eggs/fish	Eggs/pound of fish	Eggs/ounce	Percent eye-up
.5%	3,324	456	204	51.5
.75%	4,283	548	194	60.3

The number of "spent" fish was much higher at the lower feeding level. A "spent" fish is defined as one that does not yield any eggs during the spawning season. Forty-six percent of the fish at the lower feeding level were classed as spent, while 21% of the fish fed at the higher level fell into this category. This two-fold increase in spent fish at the lower feeding rate is, I believe, attributable to inadequate feeding levels for greater egg production.

Table 2.--Pounds of food fed, food cost and cost/1,000 eyed eggs produced by fish fed at two rates.

Feeding Level	Pounds food fed	Food cost	Cost/1,000 Eyed eggs
0.5%	659	\$145	\$2.23
0.75%	844	\$185	\$1.50

As indicated in Table 2, it costs 22% more to feed at the higher level, but the cost of the product in terms of eyed eggs was 33% less. The higher unit cost of eyed eggs at the lower feeding level is due to the larger number of non-producing fish, fewer eggs produced per fish, and lower eye-up for eggs produced.

DISCUSSION AND CONCLUSION

The importance of adequate feeding levels seems well demonstrated by this experiment. Evidence presented here indicates that lake trout have the capability of producing a certain number of eggs per pound of adult if sufficient food is available. If sufficient food is not available, some eggs may be resorbed as an energy source for the fish.

Although the cost of feeding at the higher level is greater, the per unit cost of the finished product is much less. Also, the cost of rearing the resulting fry will be less, since they are bigger and healthier, and should be easier to rear in the early stages of growth.

Based on the results obtained in this study, I recommend feeding mature female lake trout brood fish at least at the 0.75% level. All mature female fish at the Marquette brood stock station have been fed this level since 1972 and egg production per fish in 1973 was the highest ever recorded.

I further believe it is very important that feeding at the higher rate begin as soon as practical after spawning to enable the fish to regain good condition and to permit optimum development of the next year's eggs.