

Fishery Resources of South Dakota

Maternal Liver and Egg Thiamine Concentrations in Walleye from Lake Oahe, South Dakota

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ABSTRACT: Thiamine analysis in all its forms (thiamine pyrophosphate = TPP, thiamine monophosphate = TMP, free thiamine = FTH, total thiamine = TPP+TMP+FTH) was conducted on maternal liver tissue and egg samples from walleye *Stizostedion vitreum* spawned at three locations on Lake Oahe, South Dakota in April 2000 and 2001. Reproductive characteristics of these fish and survival of their progeny during hatchery rearing were also recorded. In both years, liver TPP, TMP and total thiamine differed significantly between all three spawning sites, and increased with increasing distance from Oahe Dam [Cheyenne arm (CA) < Moreau River (MR) < Grand River (GR)]. In 2000, liver FTH was significantly different between CA and GR, but not between MR and either CA or GR; no significant differences in liver FTH were observed in 2001. No significant differences in egg thiamine levels were observed between any of the spawning locations, but samples were only analyzed from all three sites in 2001. Mean CA egg thiamine concentrations increased from 2.60 nmol/g in 2000 to 6.42 nmol/g in 2001. Embryo survival to hatch was extremely variable each year and was not correlated to any egg thiamine forms. Significant, but weak, correlations were observed between egg thiamine levels and walleye fry survival post-hatch. The increases in liver thiamine with increased distance from Oahe dam may be due to differences in adult walleye consumption of thiaminase-containing rainbow smelt *Osmerus mordax* between the spawning locations. Reproductive performance data was likely influenced by severe dietary stress and may be atypical.