Chinook Egg Thiamine, Macaulay 2025, DIPAC Report

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Introduction

This report is an analysis of Chinook salmon egg thiamine. Eggs were collected from returning Chinook salmon at DIPAC's Macauley Hatchery in Juneau, AK on 2025-08-15.

For this analysis, individuals with eggs containing less than 5 nmol thiamine per gram are considered to be "thiamine deficient", this is the consensus literature value for deficient eggs.

Glossary of Variables

`mid-eye-fork-length` The length in millimeters for each fish, taken from the middle of the eye to the fork in the caudal fin.

`avg_egg_mass_g` The average mass of the eggs sampled for thiamine for each fish, measured in grams. Determined by dividing the total mass of the eggs sampled by the number of eggs sampled for thiamine analysis.

`total_egg_mass_g` The total mass of eggs, in grams, for each fish, measured at DIPAC after fertilization and water hardening.

`est_fecund_n` The total estimated fecundity, representing the total number of eggs produced by each female. Provided by Arthur Hamlett, DIPAC.

`nmolT_g` Nanomoles of thiamine per gram of egg.

`nmolT_egg` Nanomoles of thiamine per egg.

Histograms

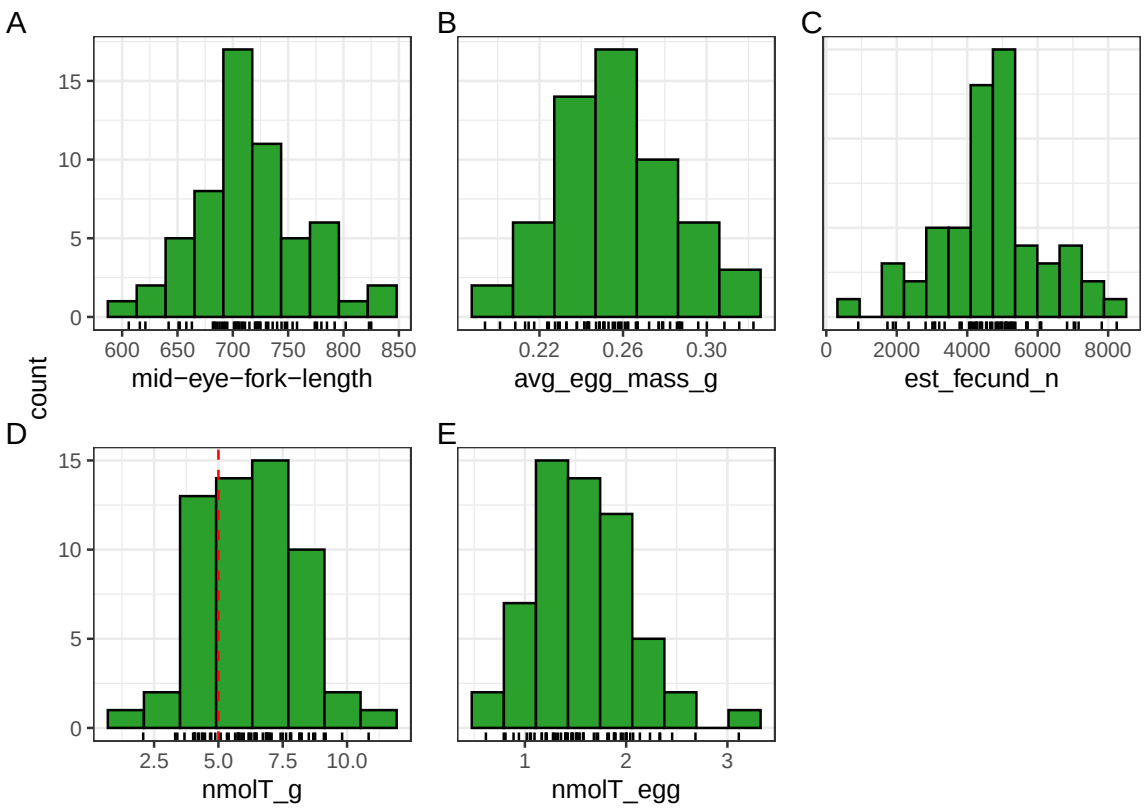

Figure 1: Histograms for various fish and fish egg variables. The x-axes are the variables we have measured, the y-axes are the counts of how many fish fall in to each 'bin'. The red line in panel D represents the 5.0 nmol T/g benchmark below which we expect to observe offspring mortality.

Everything is looking pretty normally distributed,

Summary Statistics

Table 1: Summary Statistics for Fish and Egg Variables

Variable	Mean	Std. Dev.	Min	Max	Median
avg_egg_mass_g	0.26	0.03	0.19	0.32	0.25
est_fecund_n	4700.81	1505.90	907.00	8243.00	4758.50

Variable	Mean	Std. Dev.	Min	Max	Median
mid-eye-fork-length	714.14	47.04	606.00	825.00	708.50
nmolT_egg	1.59	0.49	0.61	3.11	1.51
nmolT_g	6.24	1.80	2.08	10.84	6.23

Of the 58 females we measured eggs from (2 BKD positive fish removed), 16 (27.6 %) fall below the established offspring mortality benchmark (5.0 nmol T/g). We have enough individuals classified as "deficient" that we should be able to determine if this 5.0 nmol T/g benchmark is accurate for Andrew Creek Chinook salmon.