Adult Feeding Regimens Alter Larval Zebrafish Phenotypes

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Outline

- Introduction
- Study design
- Results
- Conclusions
Introduction

• No standardization of zebrafish feed
• Effects growth, spawning, and fecundity
• Embryos and larvae rely on yolk for nutrients
Clutch size differed between feed regimens

- Mean Clutch Size
- Brine
- Gemma
- Zeigler (2.5%)
- Zeigler
Fecundity differed between feed regimens

Fertilization (Mean %)

- Brine: a
- Gemma: b
- Zeigler (2.5%): ab
- Zeigler: ab

Feed regimen
Behavior in zebrafish

• Development and behavior
• Responses to sensory stimuli in environment
  – light
  – sound
Study Design

Collect embryos from WT crosses

Identical rearing conditions

Put larvae on system

5 dpf

90 dpf

30 dpf

Juvenile

150 dpf

Adult

Different feeds

Larval growth & behavior
Study Design

• Tubingen long-fin (TL)
• Four adult feeding regimens
  – Zeigler Adult Zebrafish Complete Diet
  – Gemma Micro 300
  – Artemia spp. (Bring Shrimp Direct)
  – Zeigler Adult Zebrafish Complete Diet

\[ 5\% \text{ body weight (2 feedings)} \]
\[ 2.5\% \text{ body weight (1 feeding)} \]
Study Design

- Growth
- Swimming ability
- Environmental stimuli
  - Light
  - Sound
Larvae from Zeigler-fed fish are shorter at 5, 6 & 7 dpf
Startle modulation with clinical relevance: Prepulse Inhibition (PPI)

Non-startling stimulus → Interstimulus Interval (ISI) → Startling stimulus = Reduced startle probability

PPI is observed across vertebrates
Larvae from Gemma-fed fish exhibit reduced PPI at 30ms ISI.
Conclusions

• Maternal nutrition can affect larval zebrafish growth and behavior
  – mammals

• Importance of reporting feed regimens
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Fecundity differed between feed regimens

![Bar chart showing fertilization (Mean %) for different feed regimens: Bx2, Gx2, Zx1, and Zx2. The bars are labeled with letters indicating significant differences.](image)
Clutch size differed between feed regimens
5 dpf

Mean Standard length (mm)

Feed regimen

Bx2    Gx2    Zx1    Zx2
7 dpf