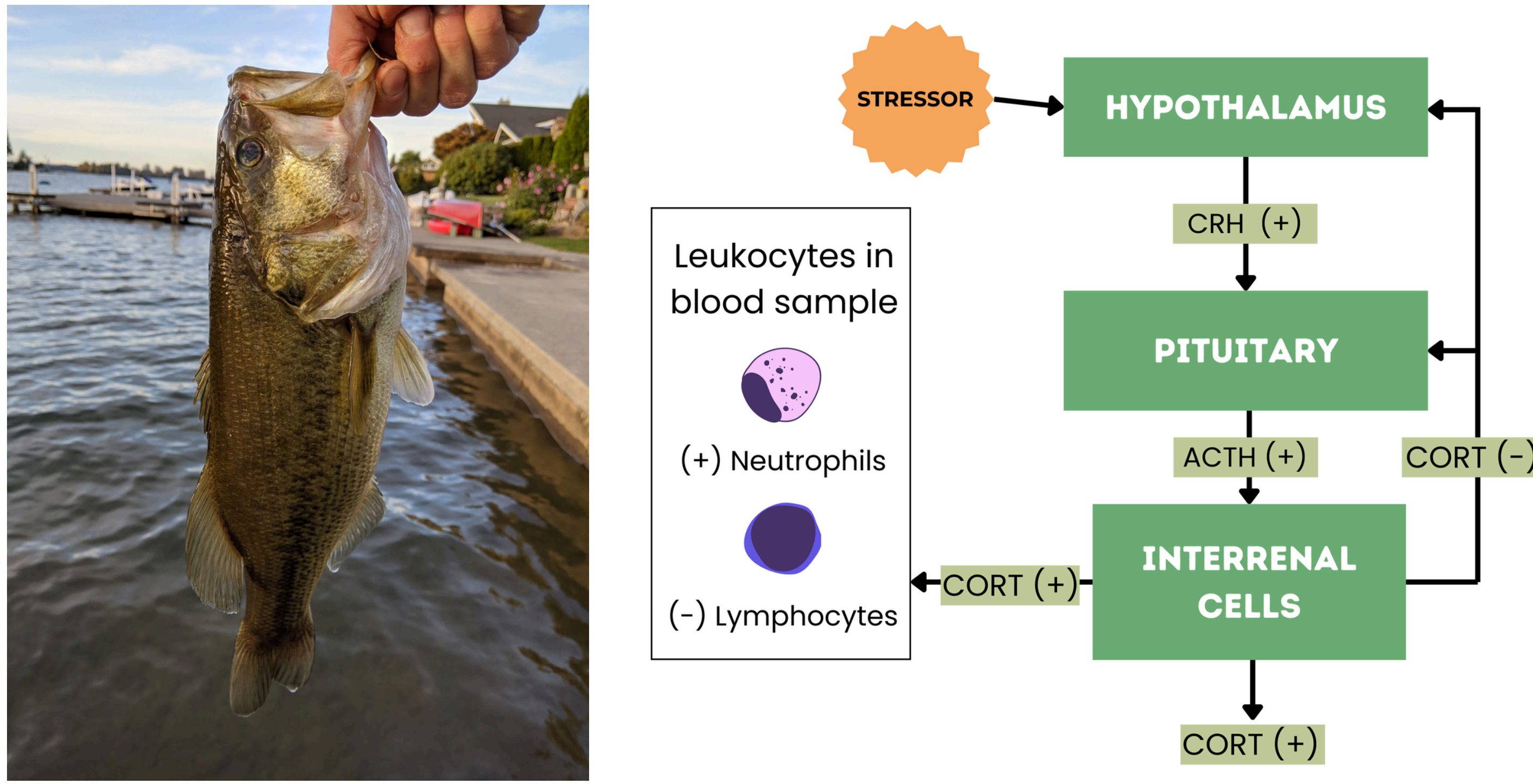


# PFAS Confounds the Stress Response in Largemouth Bass (*Micropterus nigricans*)

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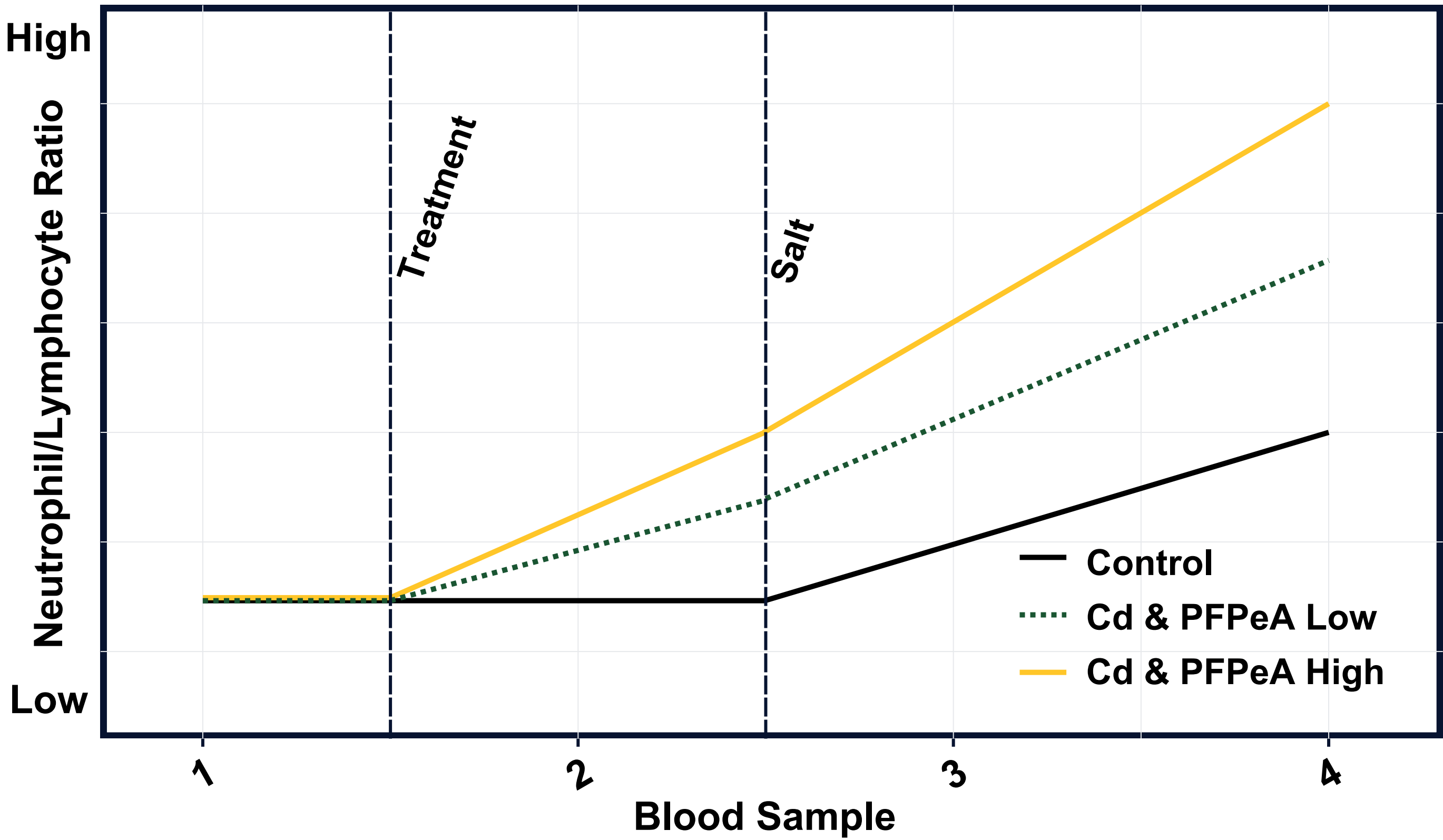


- Humans **introduce toxins** into aquatic environments, impacting water bodies.
- Cd** is a persistent toxic metal that accumulates in aquatic food webs, affecting wildlife.
- PFASs** are widespread, resist degradation, and pose risks to aquatic organisms.
- Aquatic organisms face direct exposure to toxins, which may **cause stress**.
- The **NLR** is a reliable indicator of chronic stress in organisms.
- Allostatic load** refers to the cumulative physiological cost of maintaining homeostasis under change.



## Background

Figure 1. Hypothesized effects of treatment and salt on stress in bass.



**Purpose:** This study examines Cd and PFPeA effects on bass stress response using NLR.

**Objectives:** Assess if Cd or PFPeA—a PFAS chemical—induce allostatic load and investigate how they interact with stressors.

**Hypothesis:** Cd & PFPeA exposure will elevate NLR, especially when combined with stressors.

## Methods

Figure 2. Aquaculture tank design, using randomized treatment groups.

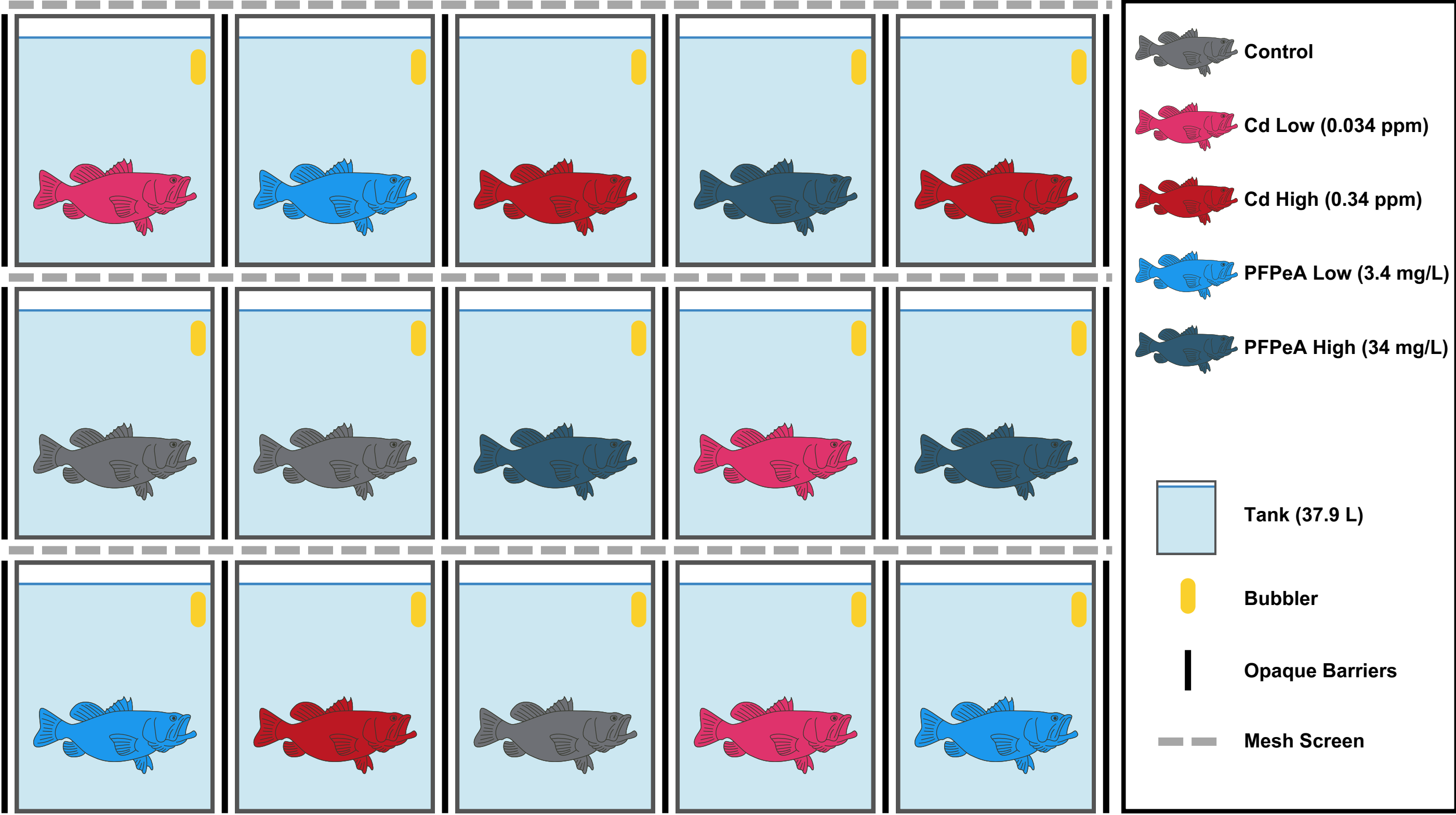


Figure 3. Experimental timeline.

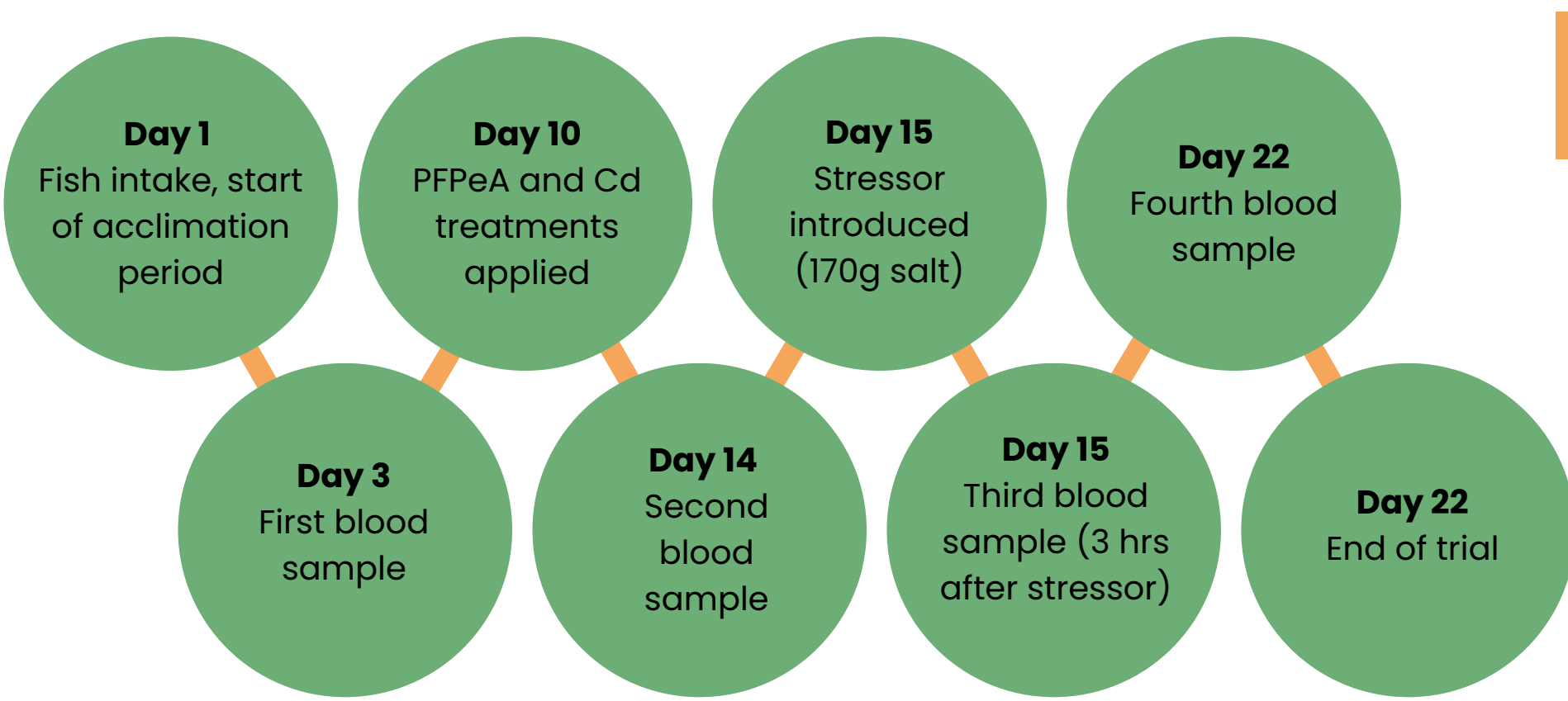
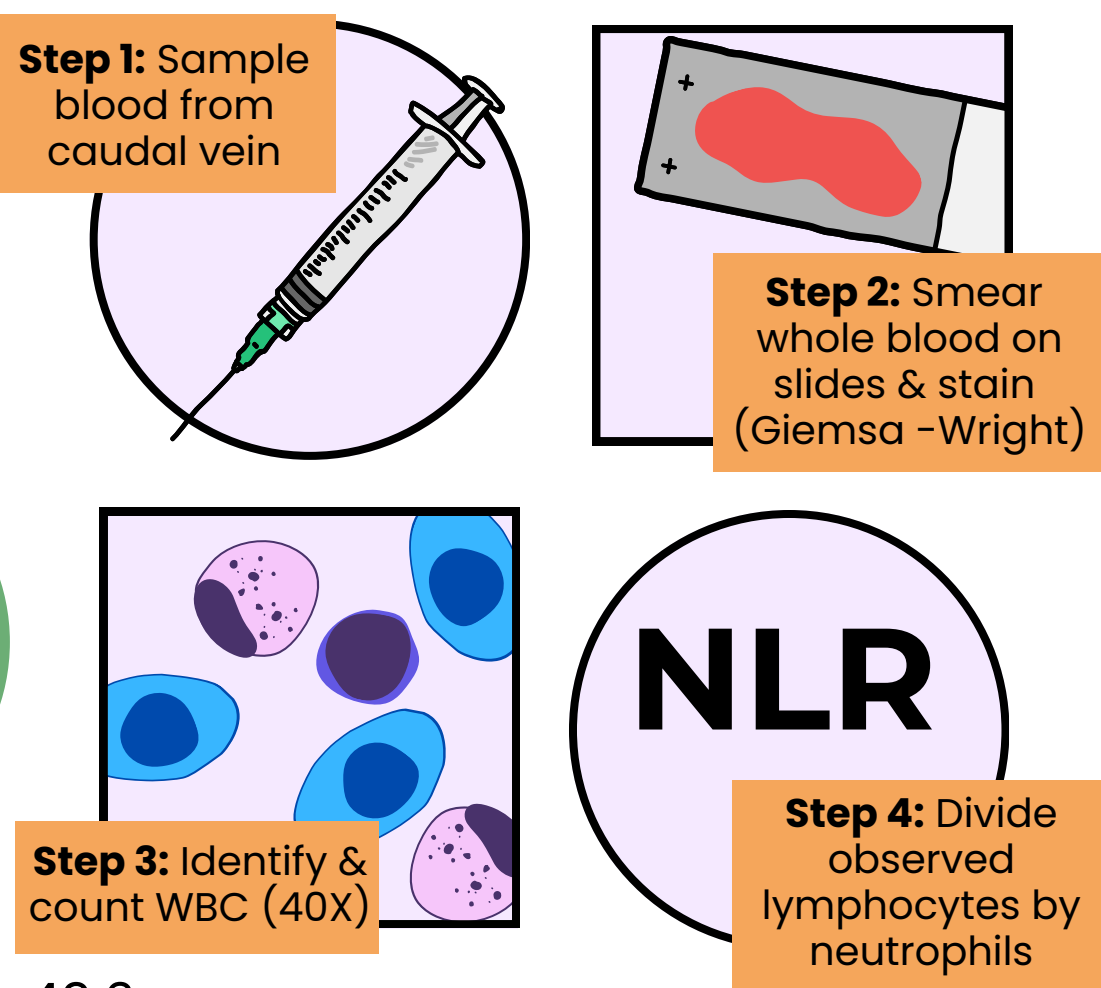


Figure 4. Steps to obtain NLR.



Bass had a mean length of 183.9 ± 28.7 mm & a mean weight of 78.6 ± 42.6 g.



- Qualitatively assessed water quality
- GLM** with gamma distribution
- Fixed effects:** treatment, blood sample
- Interaction:** treatment × blood sample

## Results & Discussion

- Differences in water quality remained constant among tanks (Figure 5)
- Applying **treatments did not increase NLR** in any group **except** in the **PFAS High group**.
- An abrupt increase in **salinity** increased to 5 ppt **increased NLR** in all groups (Figure 6).
- NLR in the **PFAS High group remained elevated**, whereas all other groups were able to recover (Figure 6).
- Results suggest that PFAS—a known environmental contaminate—may **cause allostatic load** in fishes.
- Future studies should explore the relationship of PFAS and stress at a greater scale.

Figure 5. Water quality data.

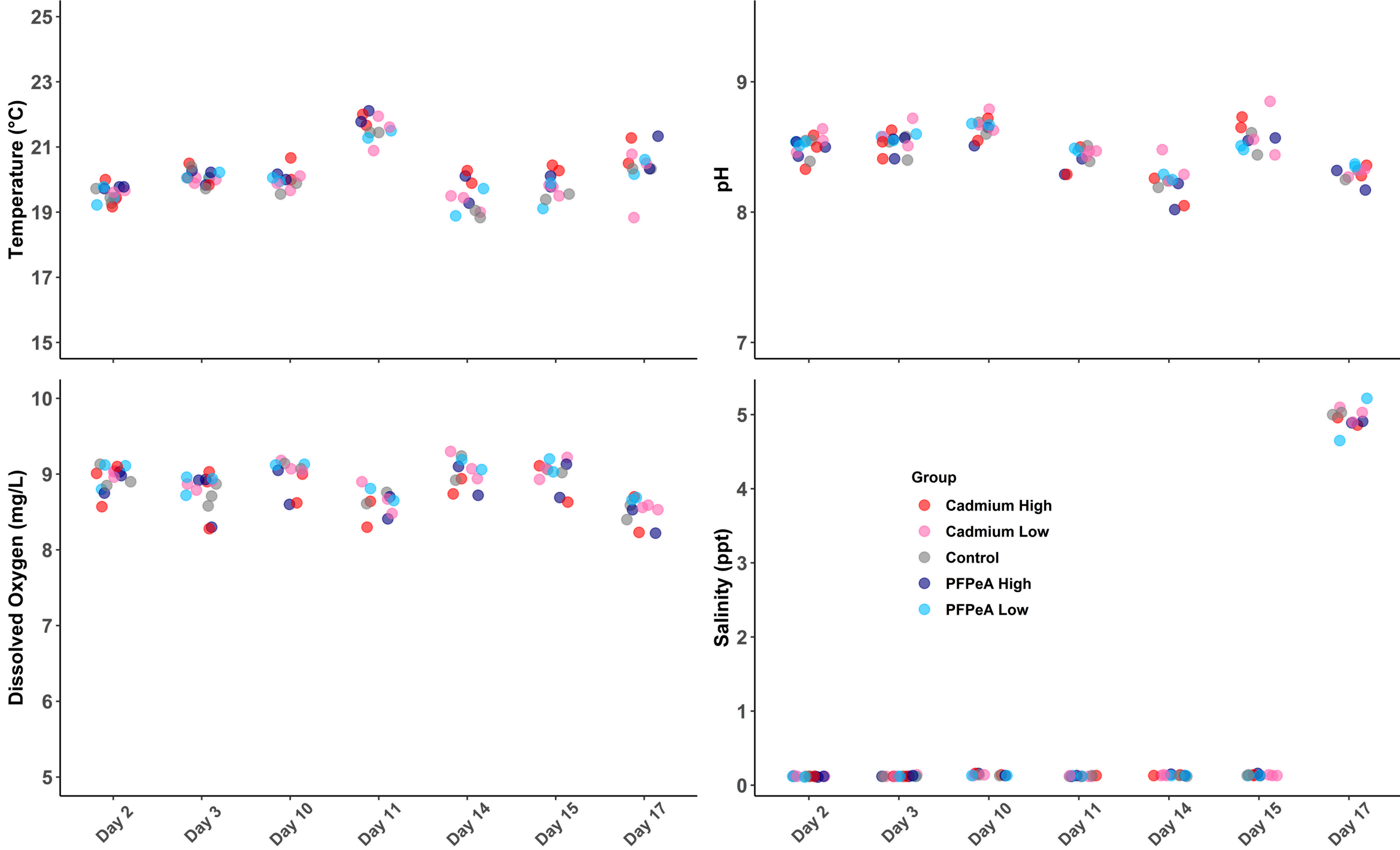
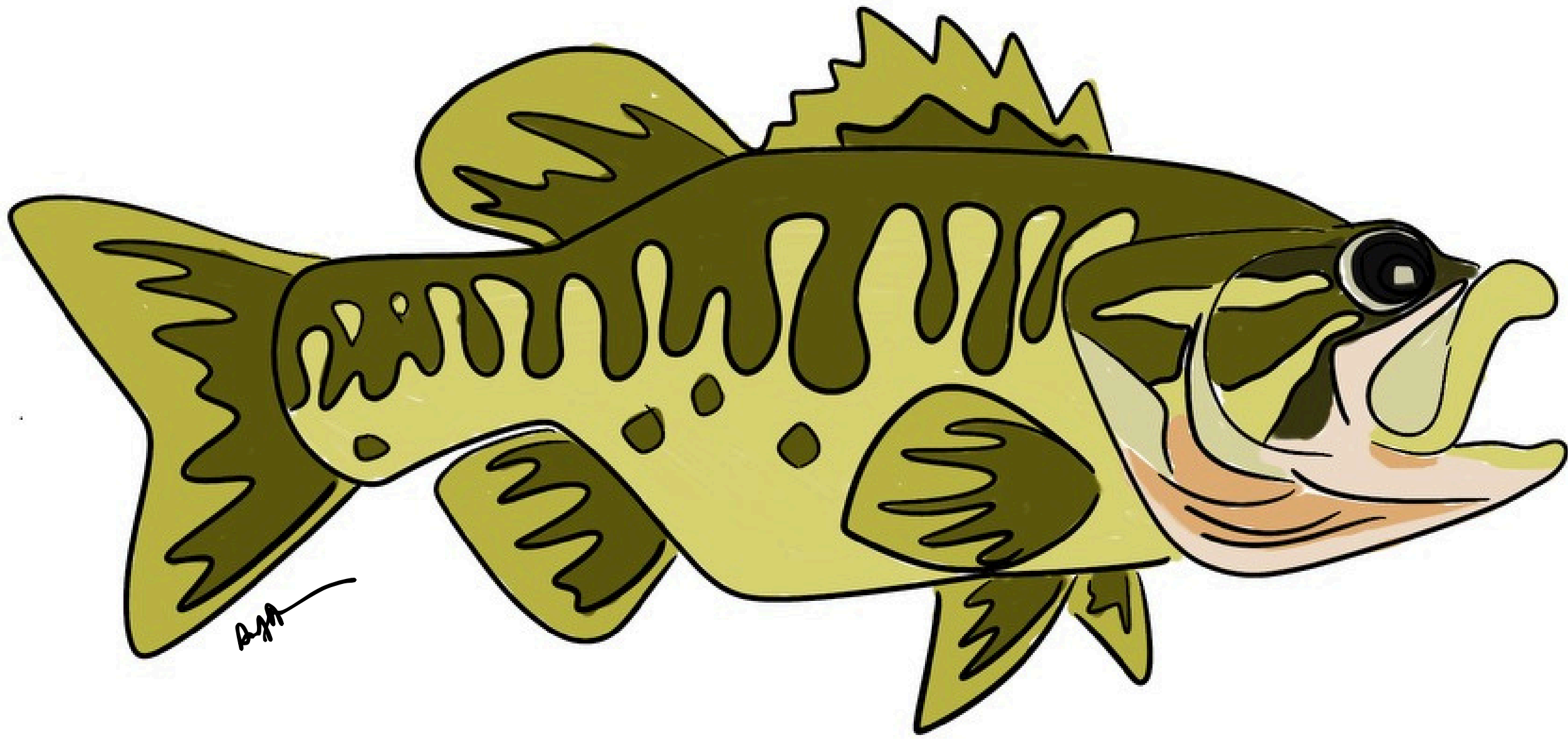
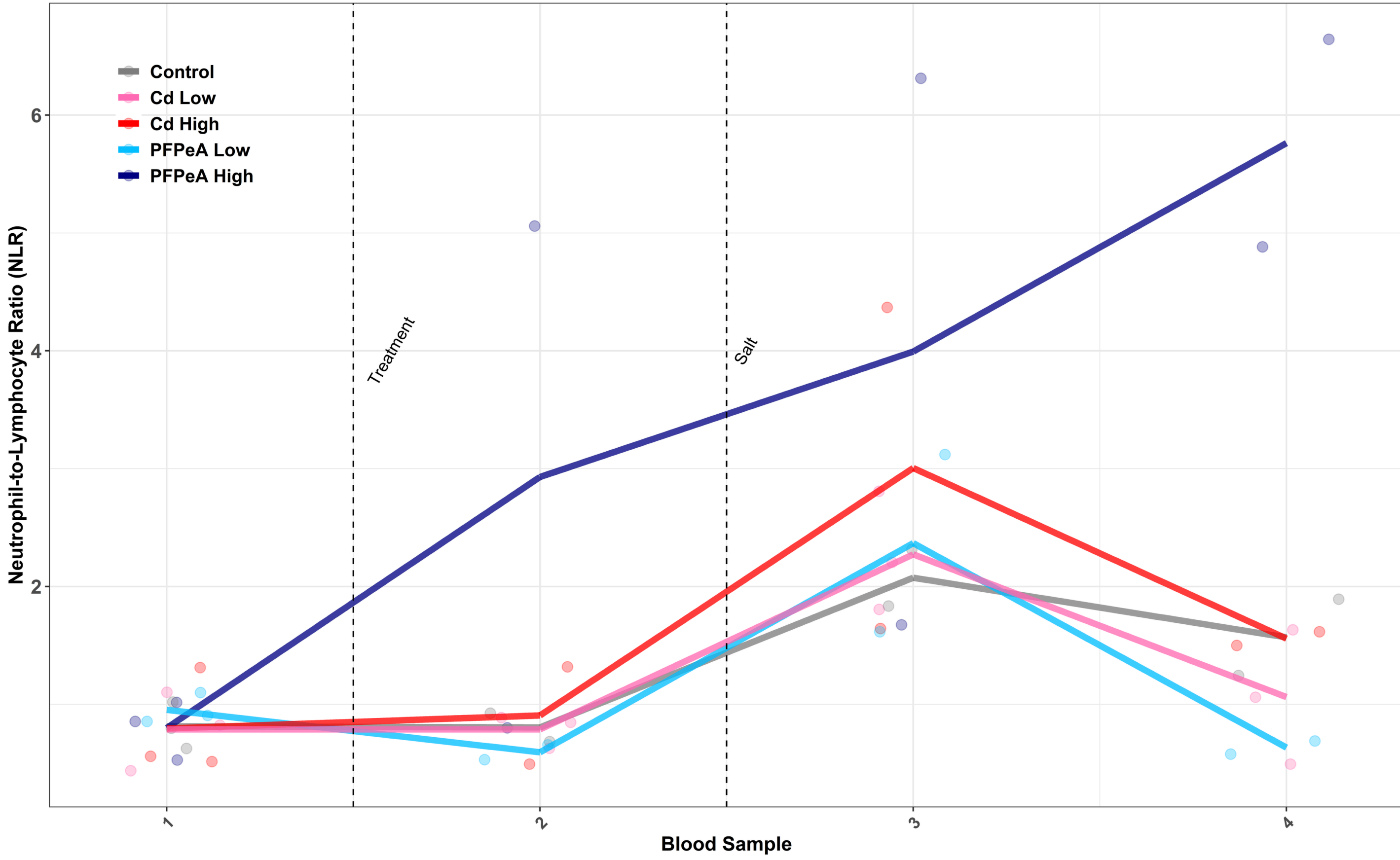


Figure 6. Comparison of NLR between and among groups.



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