

## Background

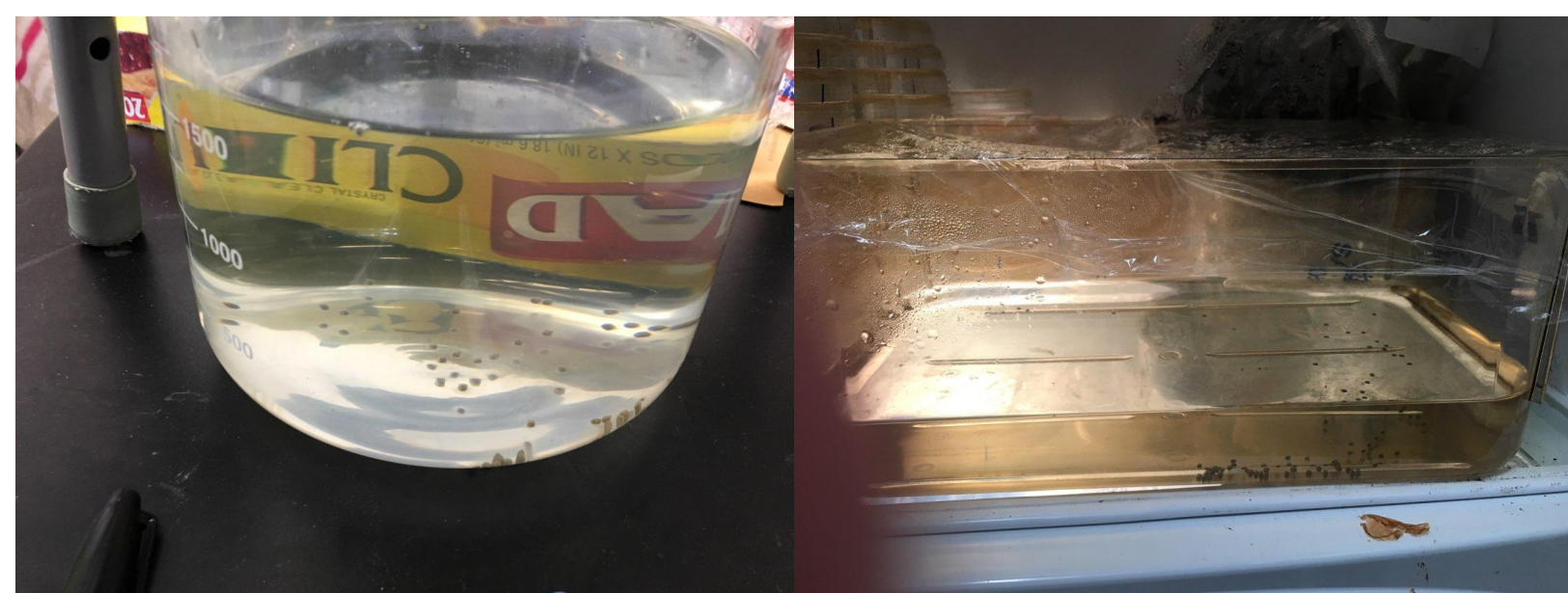
- Researched and learned that Ammonium, Nitrite, & Nitrate, at high levels, is toxic for fish.
- Ammonia is influenced by pH and the temperature to become toxic to fish.
- Excess Nitrate is important for algae and plants to grow, however Nitrate is highly toxic to fish. Though, Nitrate is less toxic to fish than Ammonia is.
- I learned this from various sites during my research, some of which will be included in the Citations area.

## Photos

### Experiment Setup



### Data Collection



## Citations

- 1) AZ, Alex Pohorly Phoenix, and Australia Michael. "Ammonia Stress and Ammonia Poisoning." *Ammonia Stress and Ammonia Poisoning - The First Tank Guide - What Are the Signs of Ammonia Stress?*, 7 Sept. 2006, [www.firsttankguide.net/ammonia-stress.php](http://www.firsttankguide.net/ammonia-stress.php).
- 2) Gallant, Micah. "Nitrates and Their Effect on Water Quality – A Quick Study." *Wheatley River Improvement Group*, Environmental Education and Rural Health, 2010, [www.wheatleyriver.ca/media/nitrates-and-their-effect-on-water-quality-a-quick-study](http://www.wheatleyriver.ca/media/nitrates-and-their-effect-on-water-quality-a-quick-study).
- 3) Oram, PG Mr. Brian. "Nitrogen Is an Essential Nutrient That Is Required by All Plants and Animals for the Formation of Amino Acids. In Its Molecular Form, Nitrogen Cannot Be Used by Most Aquatic Plants, Therefore It Must Be Converted to Another Form." *Water Research Center - Ammonia Nitrogen Toxicity*, [www.water-research.net/index.php/ammonia-in-groundwater-runoff-and-streams](http://www.water-research.net/index.php/ammonia-in-groundwater-runoff-and-streams).
- 4) "Aquatic Life Criteria - Ammonia." *EPA*, Environmental Protection Agency, 12 July 2017, [www.epa.gov/wqc/aquatic-life-criteria-ammonia](http://www.epa.gov/wqc/aquatic-life-criteria-ammonia).

# Ammonium, Nitrite, & Nitrate Water Testing

By: Michael Quinn

## Statement of Purpose

The purpose is to test how the water quality gets affected by the Trout food overtime. This experiment was to test Ammonia, Nitrite, & Nitrate levels due to those chemicals, in large quantities, can be toxic for fish. I chose this experiment so we can figure out what to watch out for when raising fish. We have two experiments, one is in room temperature, and the other is in the refrigerator at 6 degree celsius.

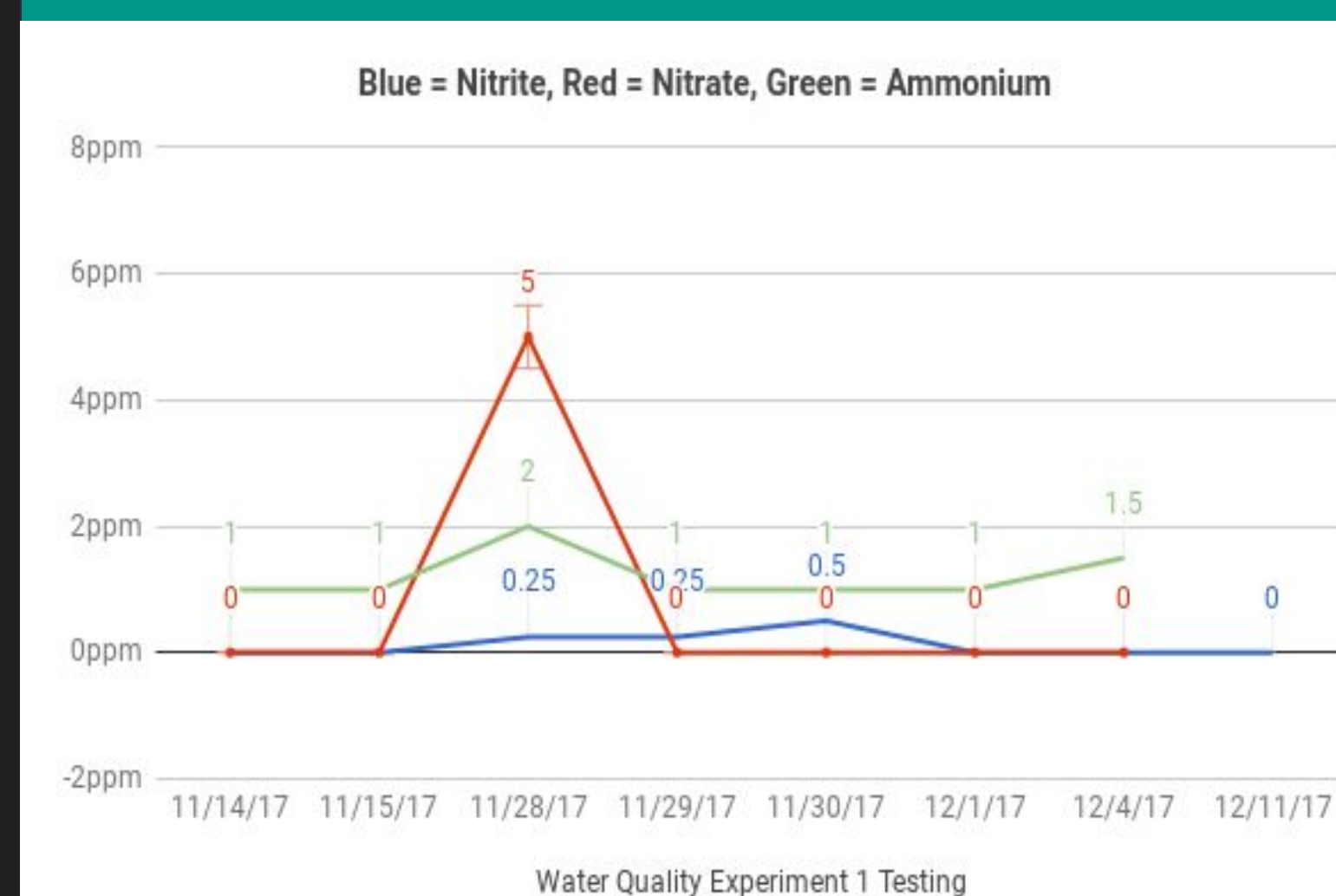
## Materials

- 2 liter beakers
- Refrigerator at 6 degrees celsius
- Cling Film
- 1 bag of Medfinn Fish Food
- Ammonium, Nitrite, & Nitrate Testing Kits
- A refrigerator is necessary because one of the experiments need to be cold to see the differences between the temperatures.
- Cling Film is used to keep the oxygen out of the experiment to prevent it from interfering with the data.

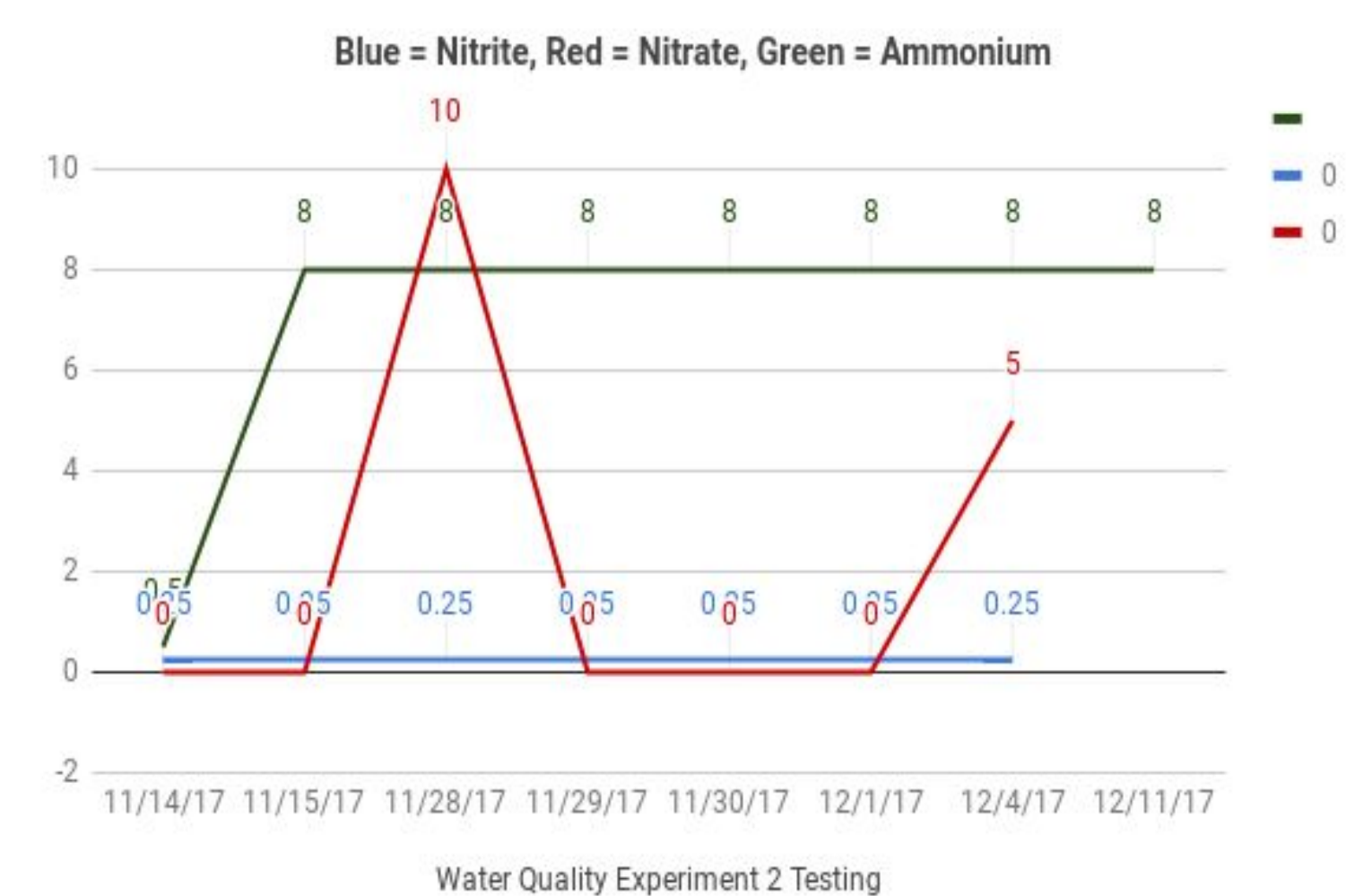
## Procedures

- 1) Started with two containers. One is a rectangle shaped container, the other is a circular jar shaped container. Start by pouring 2 liters amount of water into them.
- 2) Recorded the initial testing for both experiments, once before the fish food was added, then a testing afterwards.
- 3) Cling filmed the tops of both experiments, then put experiment 2 in the fridge.
- 4) Recorded data with the Testing Kits.

## Data and Results



- Exposure to sunlight to Experiment 1 could've caused the spikes on 11/26.
- Experiment 2's spike of Ammonium is probably due to the experiment being in the refrigerator. It was a lot more secure so it allowed less oxygen, sunlight, etc. The ammonium was allowed to spread, which probably caused Ammonia stress in the water.



## Next Steps

This can be used for those who are raising fish and those who want to know what the fish food effects in water quality. The results can also help others who may test water quality related things by letting them know what to look out for. If this experiment would happen again for further research, fixing the setup would be the top priority because the ammonium testing would be more stable.