



# The Efficacy of Aquaponics

Lance Kuwano, Scott Brunson  
Palo Alto High School



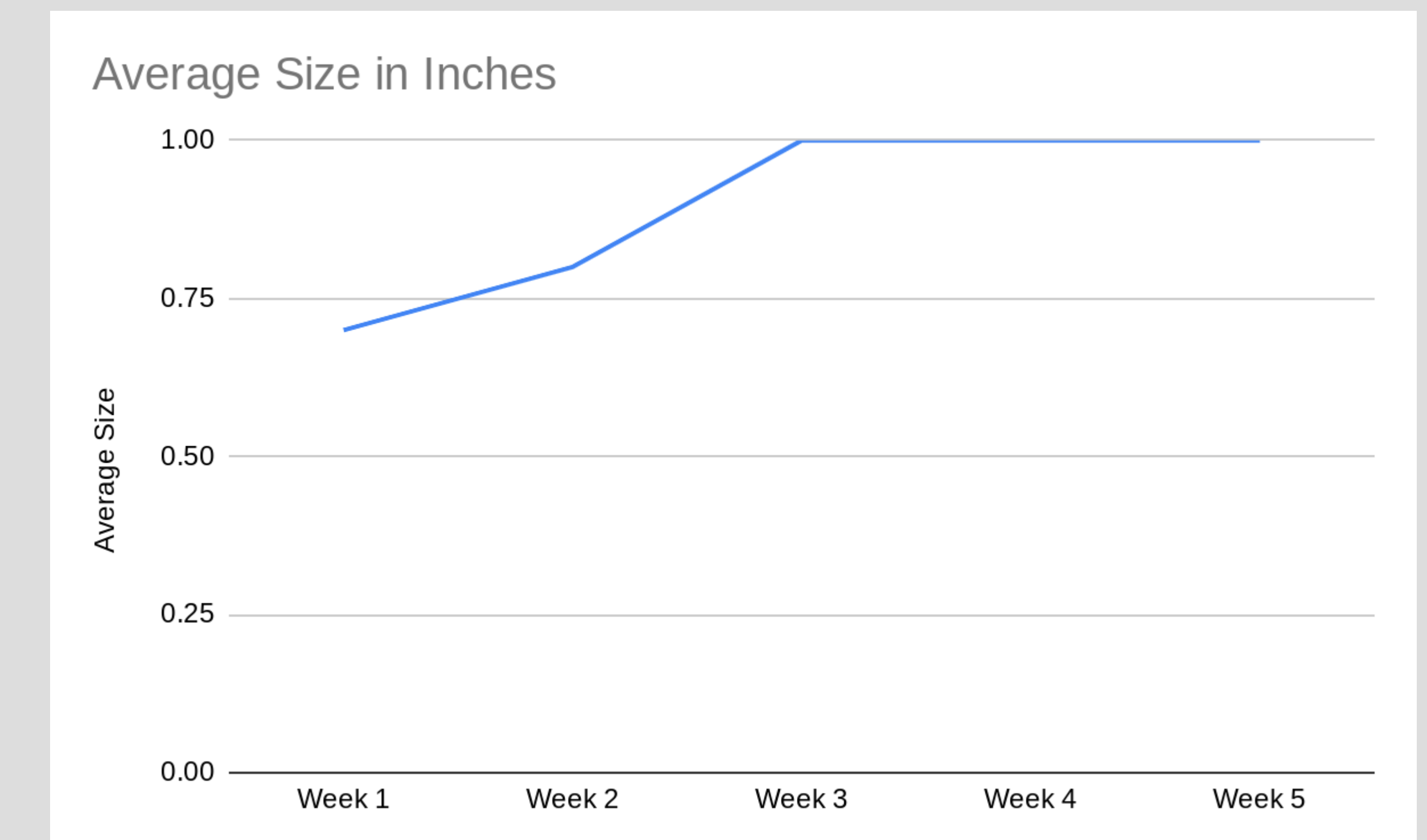
## INTRODUCTION

- Aquaponics is a type of farming which uses fish to produce nutrients.
- Fish excrement is high in ammonia which should be broken down by bacteria into nitrates which is absorbed by plants.
- The bacteria is housed in the gravel filter which the water passes through to reach the plants.

## RESEARCH METHODOLOGIES

- Exploratory
  - My research was about gathering information using that information to build an aquaponics farm.
  - My research was also about recording any setbacks I had during the process of building and recording data.
- Experimental
  - My research compares the results of plants with soil farming to the ones in my experiment.

## IMPLICATIONS AND NEXT STEPS



The estimated average growth of the fish seemed to go up over time but then plateaued at around week 3. Plant growth in the aquaponics farm grew somewhat better than the ones in soil, but were eaten by animals in my yard.

### -Implications

- Fish dying is probably related to the cold temperature or from algae
- Algae buildup due to the nitrates and ammonia is common but should be treated.
- The differences in plant growth was noticeable.

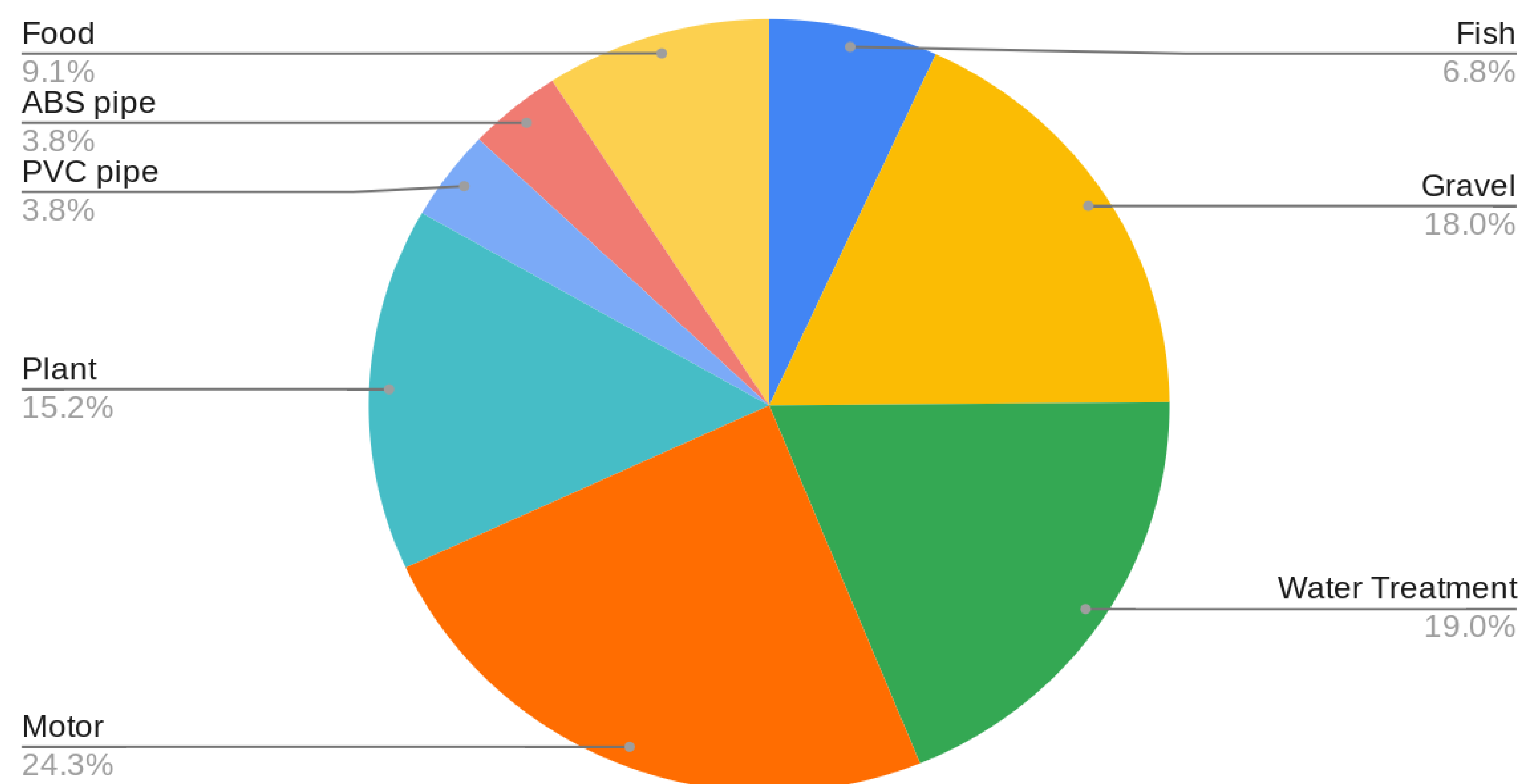
### -Next Steps

- Build netting to keep wildlife out.
- Manage algae using chemicals or different fish.
- Smaller design so its able to be kept indoors and at a higher temperature, or heating.
- Take ammonia readings to keep plants and fish healthy.

## DATA AND FINDINGS

- The fish seemed to grow at a steady rate.
- Measured fish weekly since there were not really any changes when measured daily or biweekly.
- The plants in the system looked a bit better than the ones grown in soil.
- Algae began to grow after warmer weather.
- Cold weather probably killed a couple fish, one on week 2, and two on week 5.
- Plants were eaten by animals around week 6.

Items Cost (26 Dollars)



## CONCLUSIONS AND ANALYSIS

	Cost	Amount	Website/Store
Fish		1.8	10 Petco
Container		0	1-2 Repurposed
Gravel		4.75	? Repurposed
Water Treatment		5	1 Petco
Motor		6.39	1 Amazon
Plant		4	6 Ace
PVC pipe		1	1 Ace
ABS pipe		1	1 Ace
Food		2.4	1 Amazon

### Positives

- Plants grew faster
- Fish probably grew larger
- Cheap easily obtainable parts

### Negatives

- Cold weather
- Algae buildup
- Construction took a lot of time

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