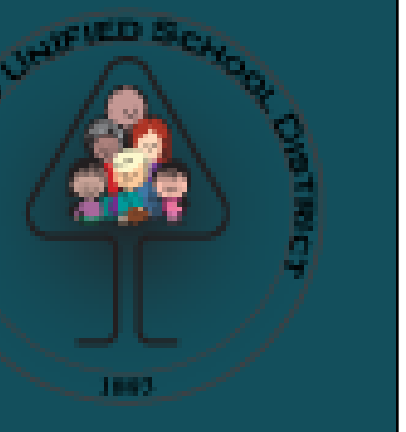




Addressing Food Insecurity through Domestic Vertical Farming

Ava Kogelnik, Hilary McDaniel, Scott Brunson



INTRODUCTION

- Food insecurity has become a serious issue
- "53.4 million Americans do not have easy access to fresh, healthy food" (Rhone, 2017).
- negatively impacted low income people in urban areas because without access to fresh food they often fall into unhealthy eating habits.
- vertical farming increase in popularity.
- not much quantifiable research on small-scale vertical
- Plausibility of in home vertical farms

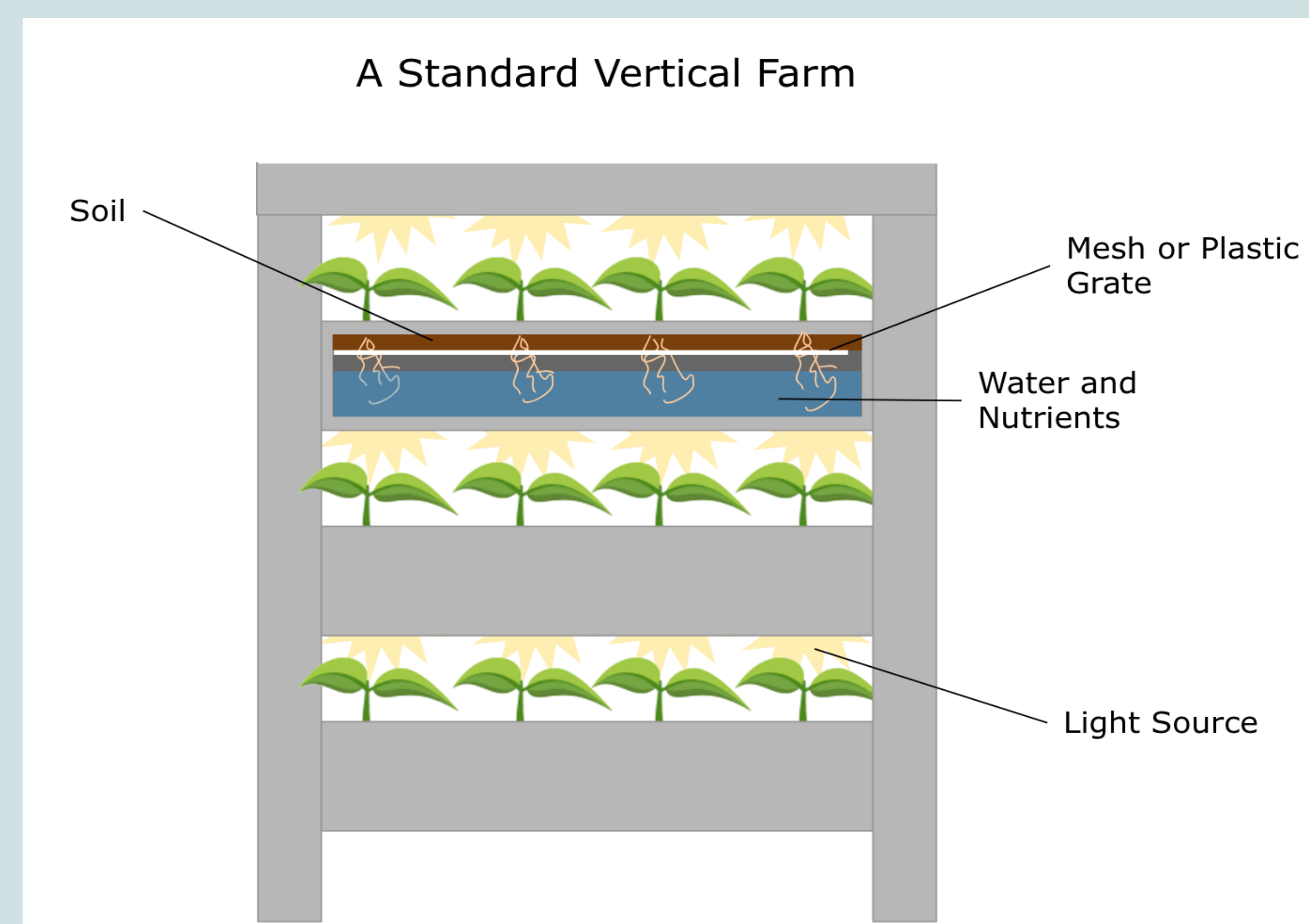
RESEARCH METHODOLOGIES

Purpose:

- Combatting food shortages and encouraging small scale farm

Study:

- cost calculation of an average domestic vertical farm
- planting 3 plants strawberry, basil and lettuce
- personal vertical farm and measured the yield from three individual types of plants over the course of 6 weeks



DATA AND FINDINGS

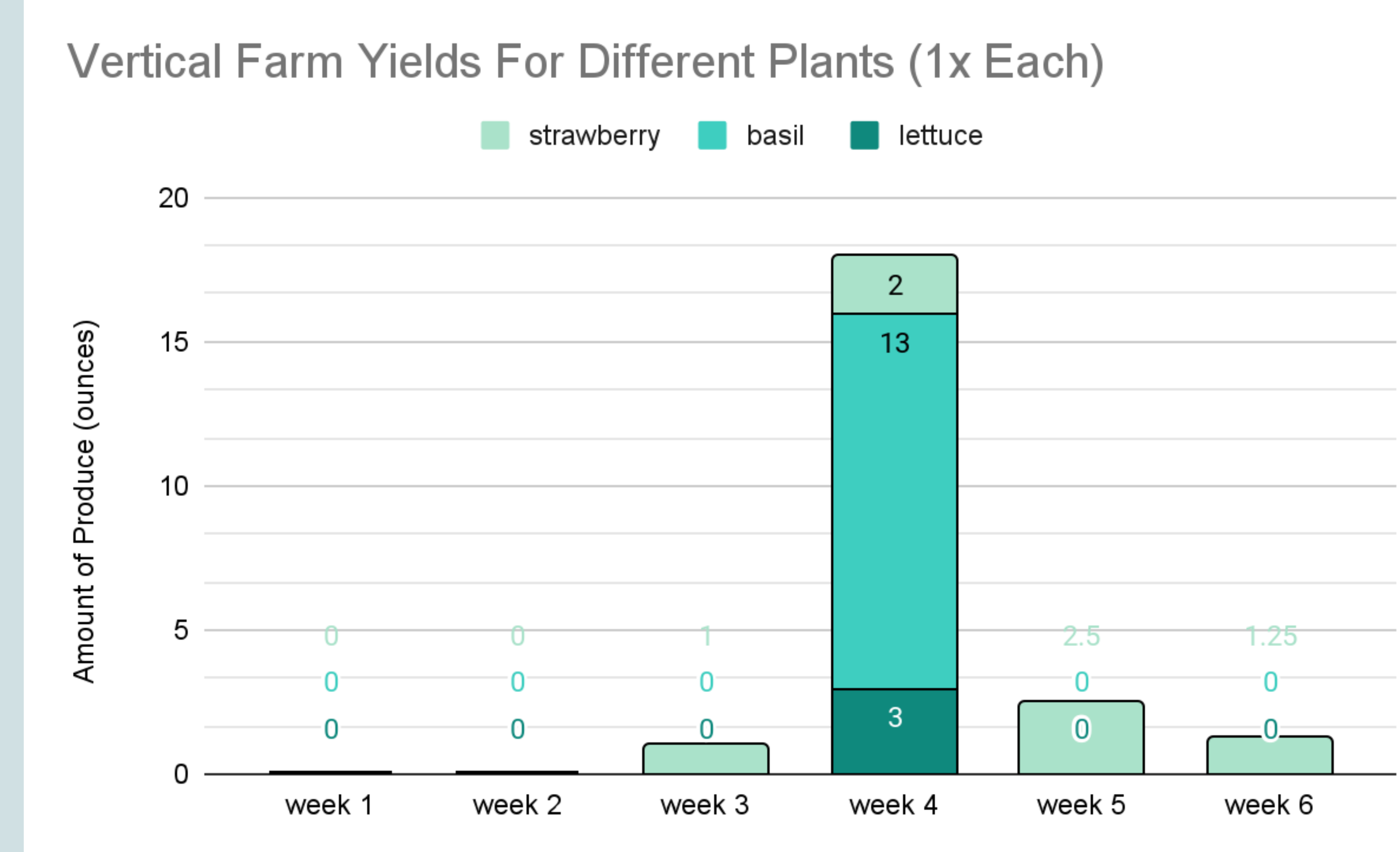


Figure 1: My vertical farm yields over the course of 6 weeks.

- Startup and run cost of a small vertical farm (80 possible plants) ~\$1,000 -
- Monthly maintenance (water electricity) ~\$17.25

CONCLUSIONS AND ANALYSIS

- Compared to an average American diet one plant from a my vertical farm produced over the course of 6 weeks
- - 1/3 of average strawberries
- - 10 times the average amount of basil
- - 1/8 the amount of average lettuce

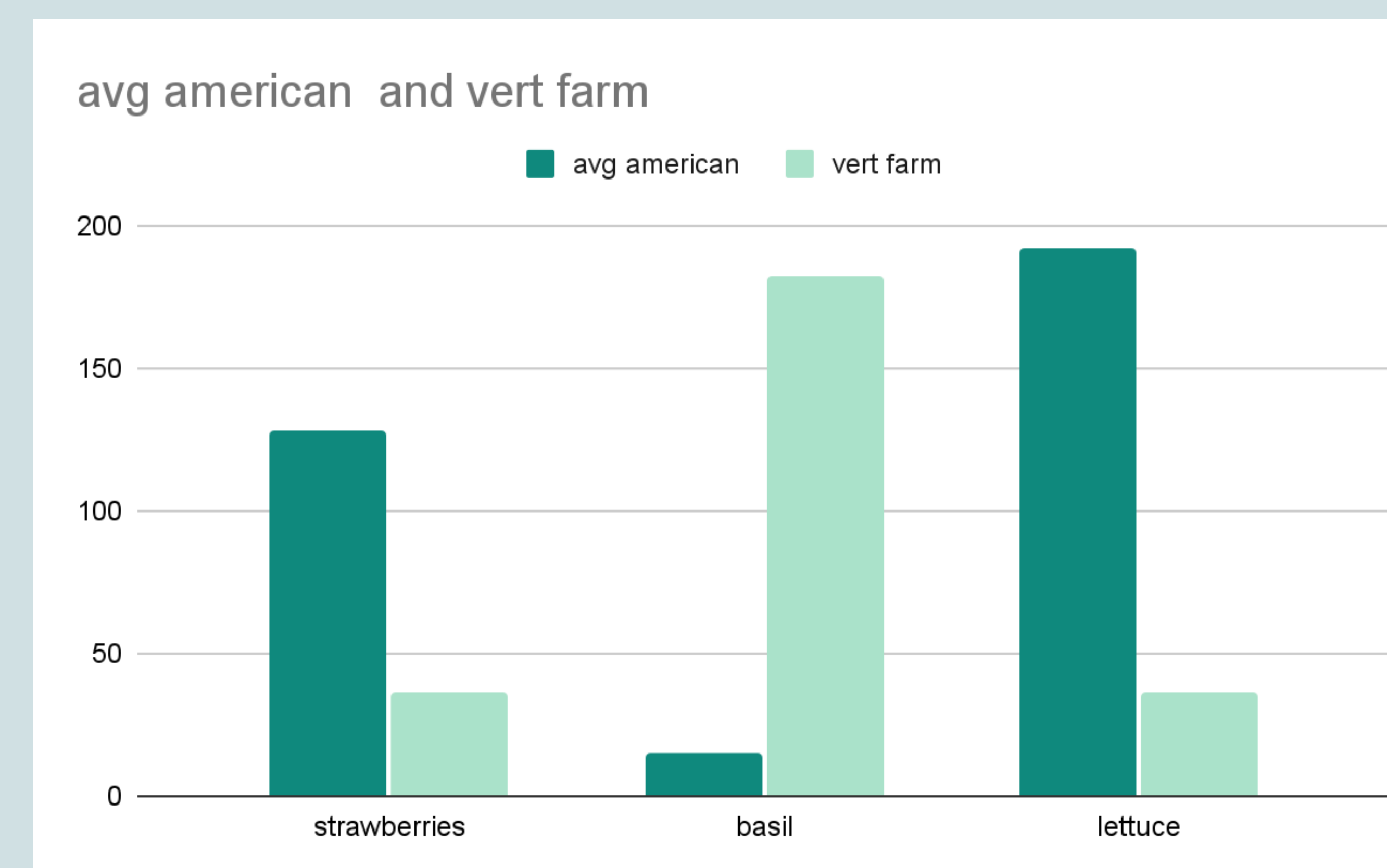


Figure 2: My vertical farm yields versus the average american consumption (one plant of each species)

- vertical farming produces a significant amount of produce
- scaling up even just a little more than 1 plant each would make this much more beneficial

IMPLICATIONS AND NEXT STEPS

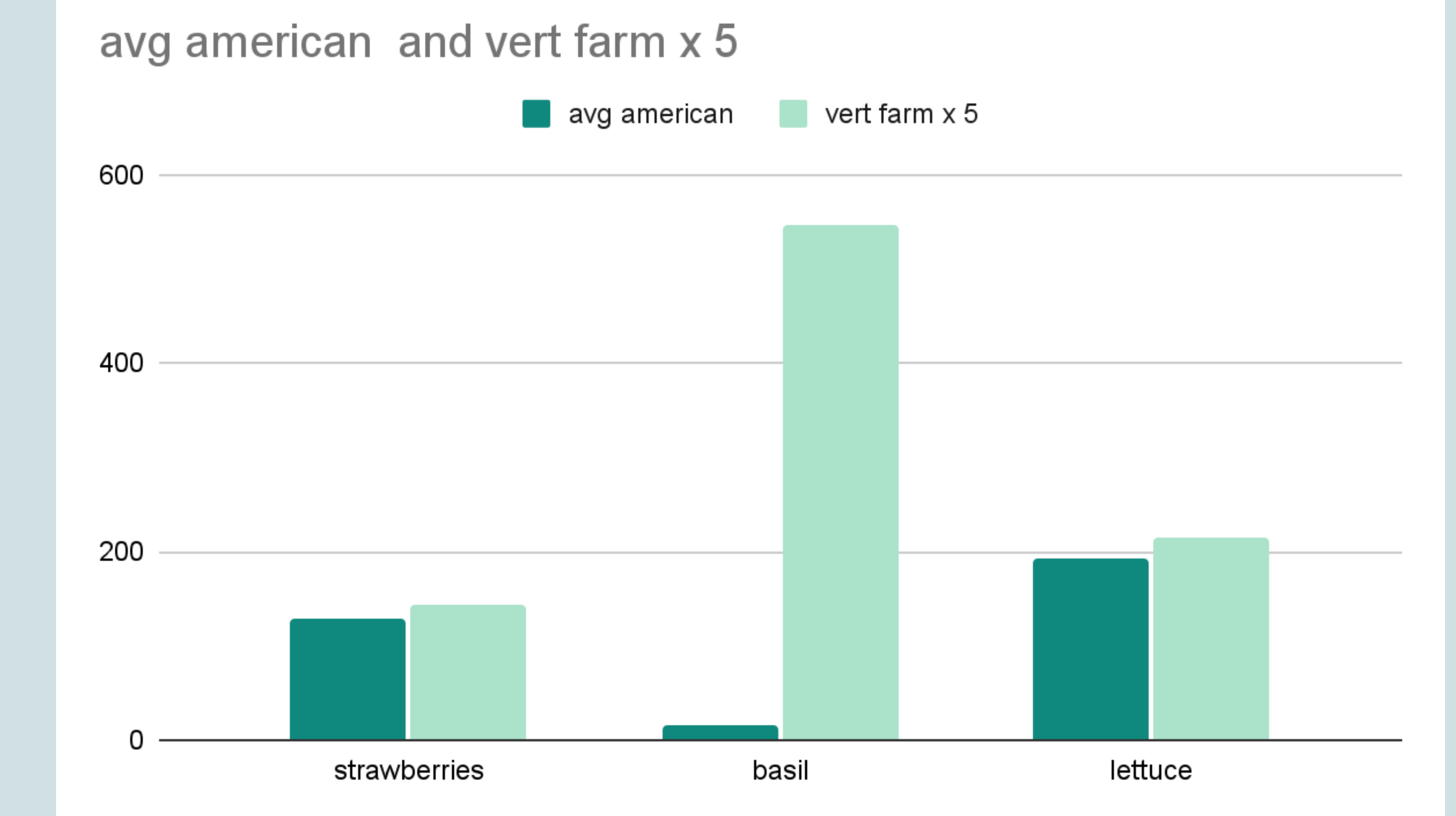


Figure 3: My vertical farm yields if I planted 5 of each plant versus the average american consumption

- according to fig 3 only 5 of each plant are necessary to fulfill the average american diet for strawberries, basil and lettuce.
- The vertical farm that I used can hold up to 80 plants which means that you could plant ~26 of each plant,
- could support a family of 3 (almost a family of 4) for an entire year of consumption (maybe even more) just using 80 plants
- adjust this depending on how much of each type of plant your family eats.

ACKNOWLEDGEMENTS / REFERENCES

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Ungvarsky, J. (2021). *Vertical Farming*. Salem Press Encyclopedia of Science This source is an overview and general introduction to vertical farming. It

explains how vertical farms are constructed and why they were constructed in the first place. The article also mentions pros and cons about vertical farming. This source is reliable because it includes well known facts and it seems very unbiased. The article is very well written and never seems to be doing anything like trying to sell a product. In addition, the author cites their sources at the end of the piece which allows us to look for further resources.

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