

# Predicting Food Insecurity with Machine Learning

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# Introduction

## Inspiration for project:

- The Bok Choy local project
- 13.7 million households experienced food insecurity in 2019
- \$161 billion worth of food thrown out each year

## Data:

- CPS Food Insecurity 2019 Data

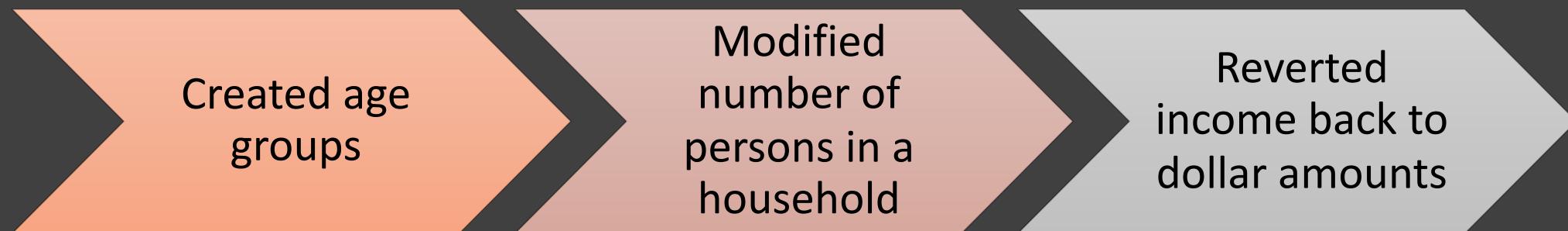
## Question to answer:

- Can we predict whether someone will experience food insecurity or not.

# Diving Deeper into the Data

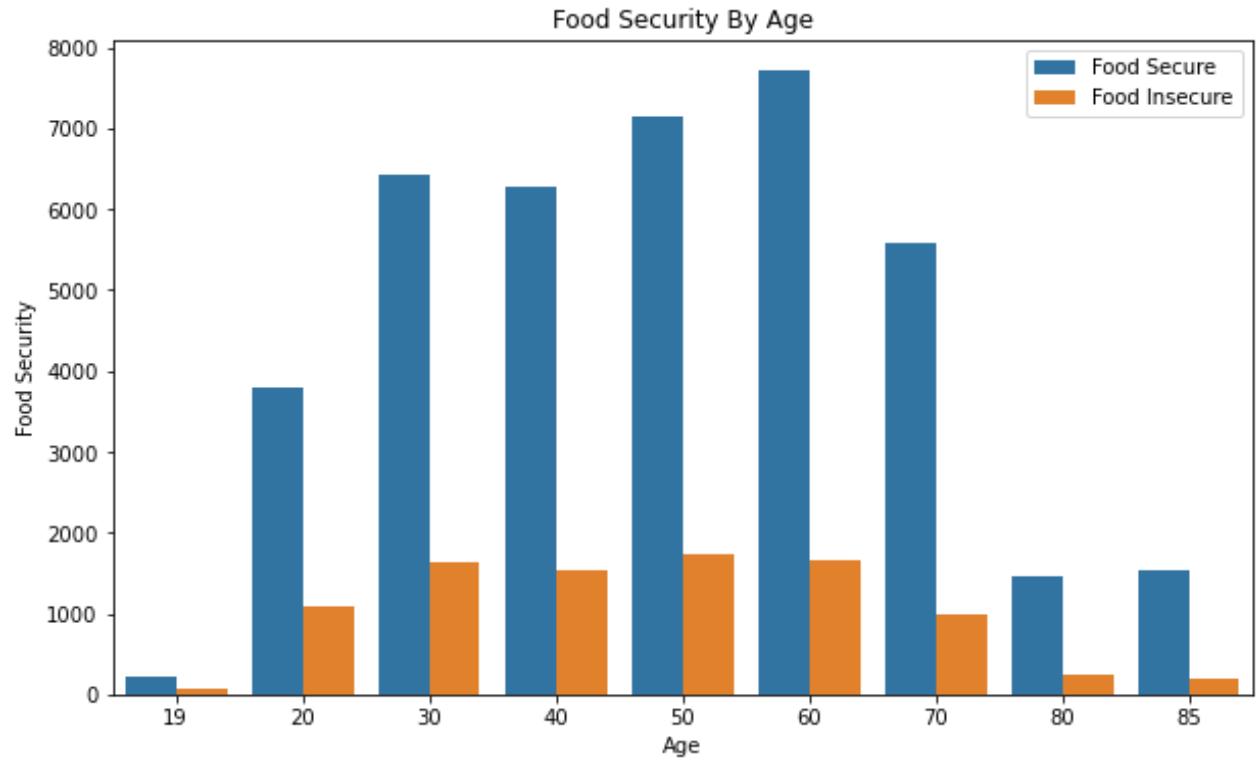
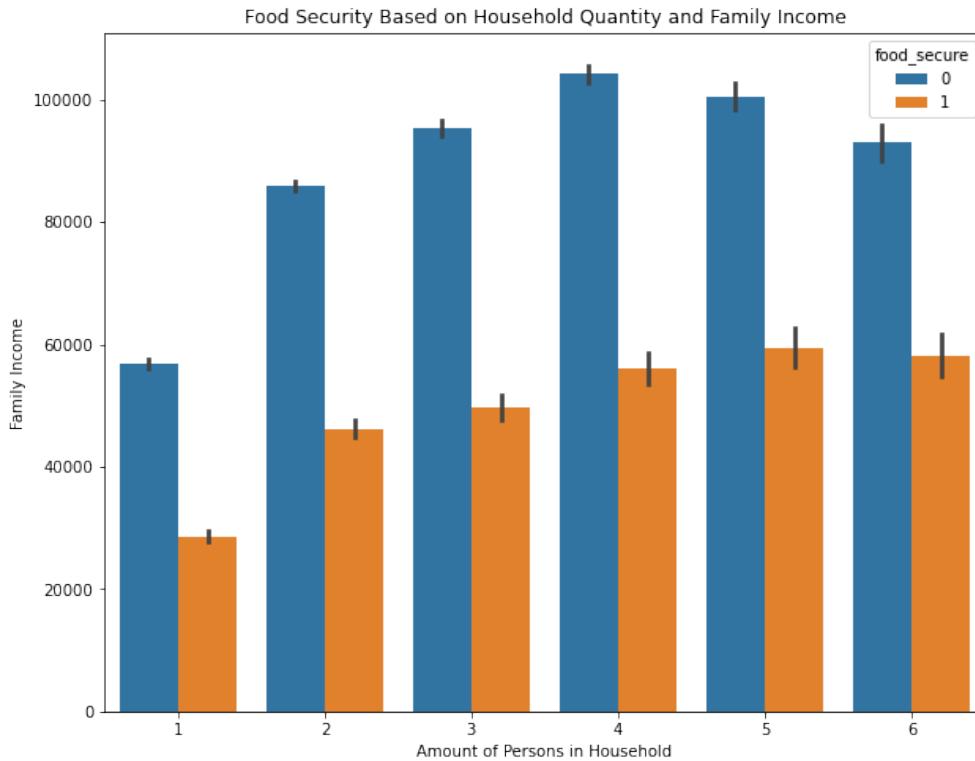
- Data and data dictionary gathered from Census.gov under their food security data sets page
- Original data set contained over 500 columns of various questions, many of which were dropped due to the replicative nature of the question
- Original data set had over 138,000 rows of which individuals from households with more than 1 person were dropped, mostly based on age
- Changed numerical values back to actual categorical values

# Variable Changes



## Exploratory Data Analysis

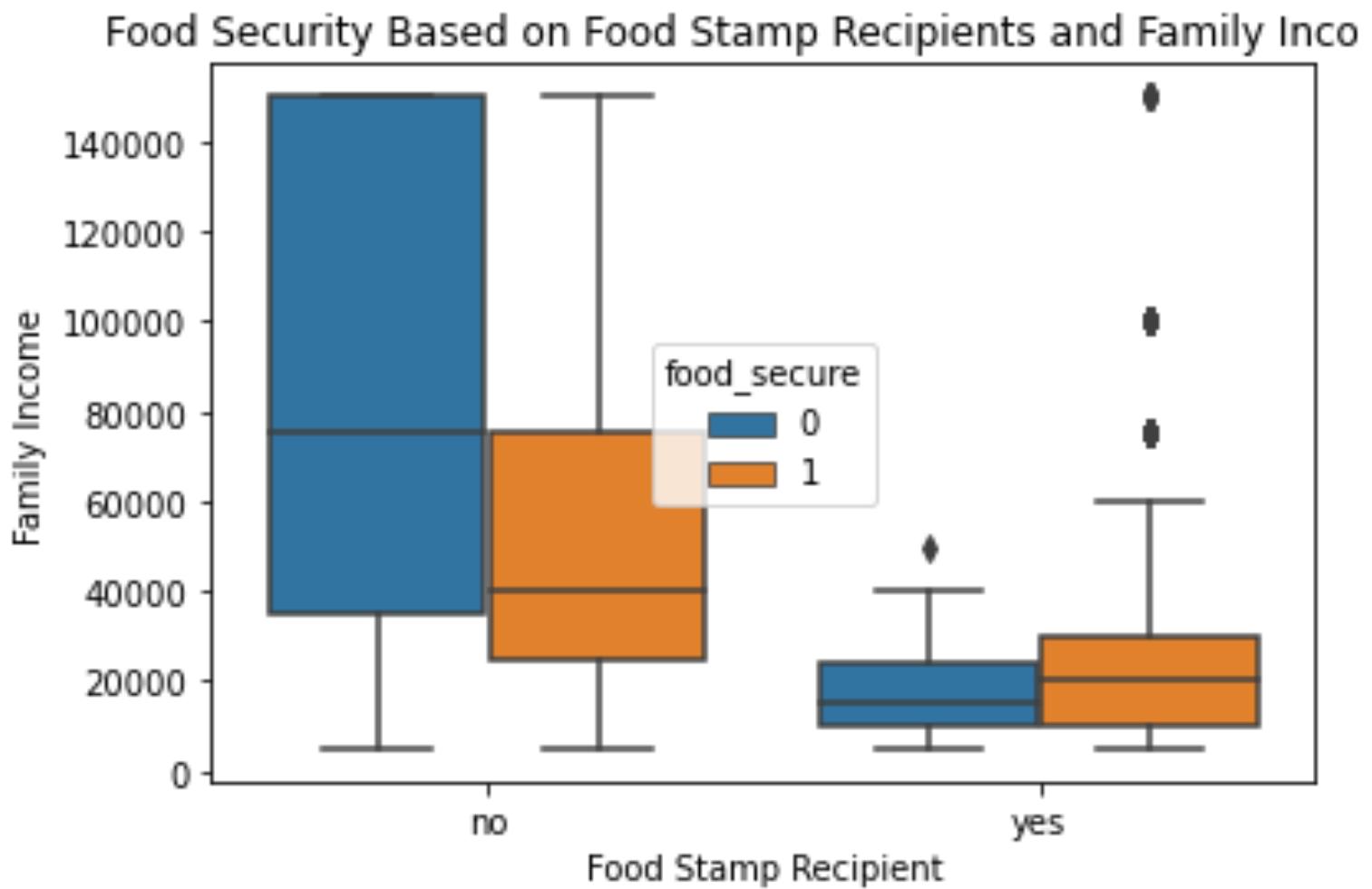
- After finishing the data cleaning process, I wanted to look for any trends or highly correlated factors that would result in an individual experiencing food insecurity
- Key explorations were hours worked in a week, difference location had on food insecurity, age analysis, number of individuals in a household as well as family income, race and ethnicity, gender, and marital status
- Turned out to be not a diverse data set



# Other Areas Explored

- Number of jobs and Food security
- Gender and Income based food security
  - Outliers found here
- Food pantry location unknown
- Family size and marital status in relation to food security
- Job type and food security levels

# Food Recipient Analysis



# Modeling Process

Question being asked → Classification modeling to answer

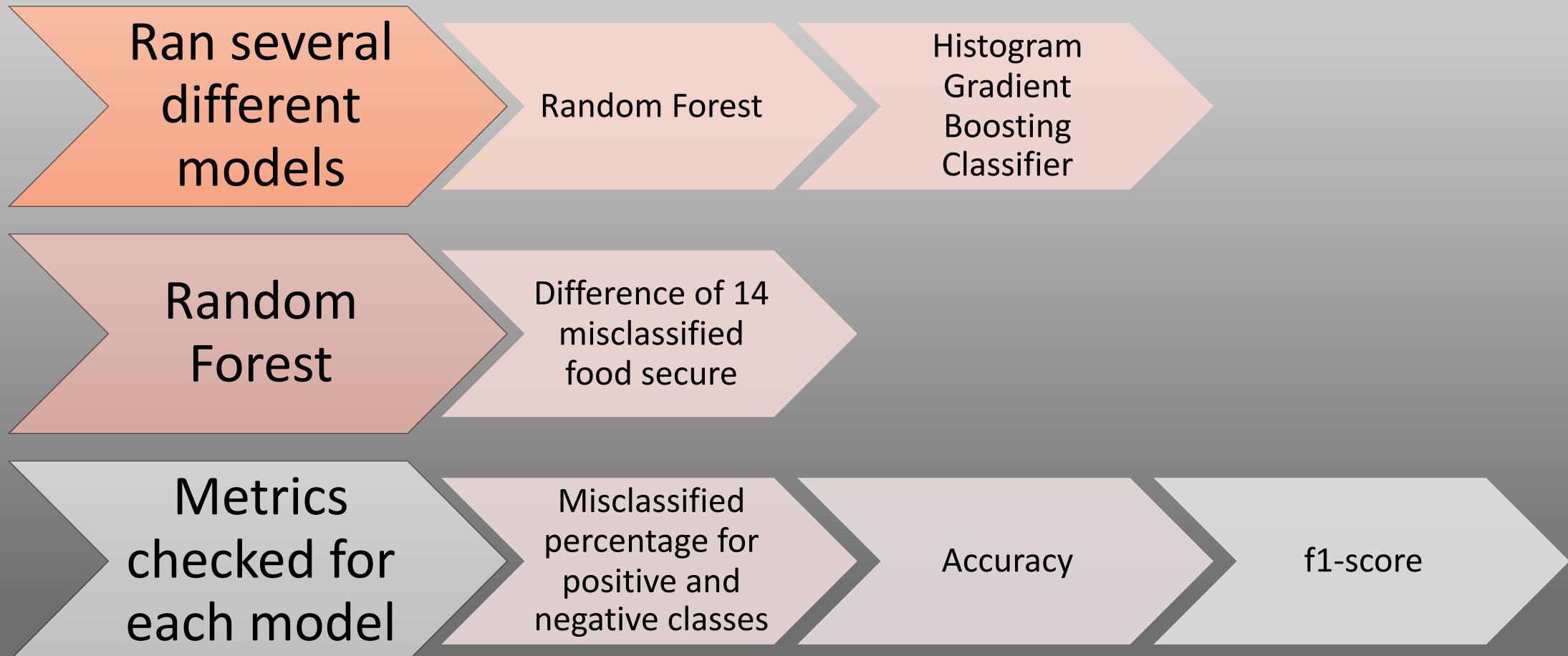
Final data cleaning steps

Pre-processing steps

Baseline score found

Wanted to minimize as many false negatives as I could

# Modeling Process Cont.

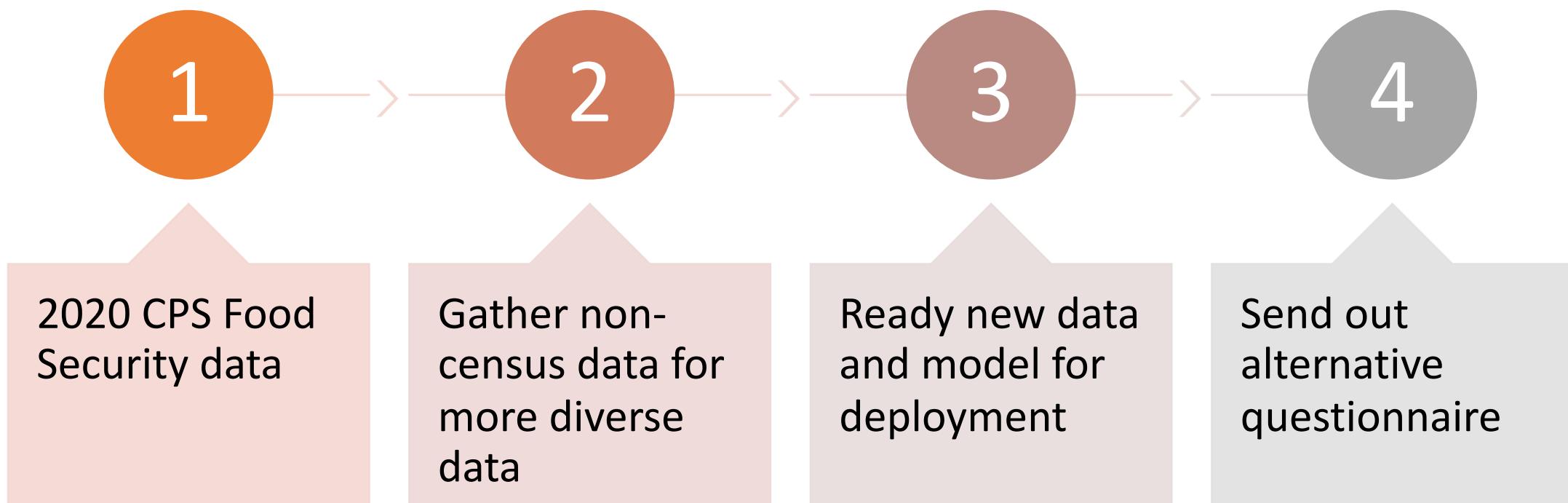


# Random Forest Model

- Well fit model
- Least amount of folks being misclassified as food secure when they are food insecure
- Highest f1 score for class 0 and class 1
- ROC-AUC score of 0.96

# Next Steps

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# Any Questions? ☺

Cucumber

99¢

The fresh produce and flowers  
are Responsibly Grown!

Yellow Squash

Grows in fallow

-Excellent yellow skin

-Sweet taste

-May be served raw or in a sliced

2.49

LB

Zucchini Squash

Grows in fallow

-Excellent taste

-Smooth skin

-Full of fiber and a good source of vitamin C

2.49

LB

99¢

Thai Chiles

Grows in fallow

4.99

LB

Poblano Chiles

Grows in fallow

4.99

LB

Jalapeno Chiles

Grows in fallow

4.99

LB

Anchovy Chiles

Grows in fallow

4.99

LB

3.99

LB

Belgian Endive

3.99

LB