



# Analysis of Zinc and Copper in Foods

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## ABSTRACT

Deficiencies in vitamins and calcium have always been known and a remedy for it has always been around. The deficiency of copper (Cu) and zinc (Zn) are not very popular and some people do not understand how important the two metals are for one's health. If one tends to encounter such deficiency the goal is to give foods that contain these metals in order to add to the diet. In this study, various foods were analyzed for Cu or Zn concentration levels using absorptions spectrophotometer Shimadzu AA-6800 flame. The samples were crushed, digested with nitric acid, and then analyzed through the AA-6800. A variety of results were obtained leading us to many possibilities of foods that have Cu and Zn.

## REASON FOR STUDY

1. Analyze Zn and Cu in food to know what to consume in case of deficiency.
2. Analysis of foods is good for general human health
3. Provide necessary data needed for monitoring foods in the stores.

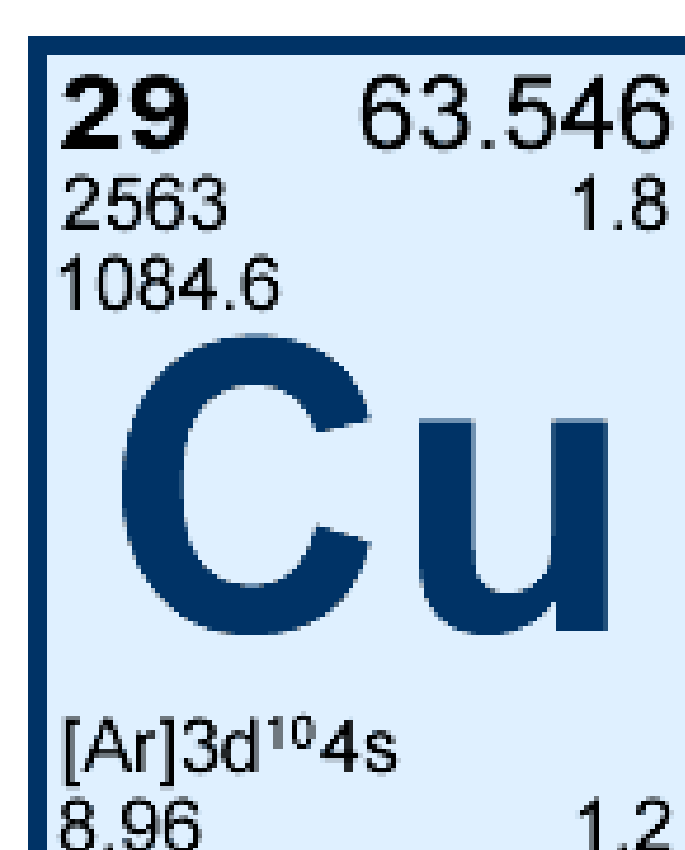
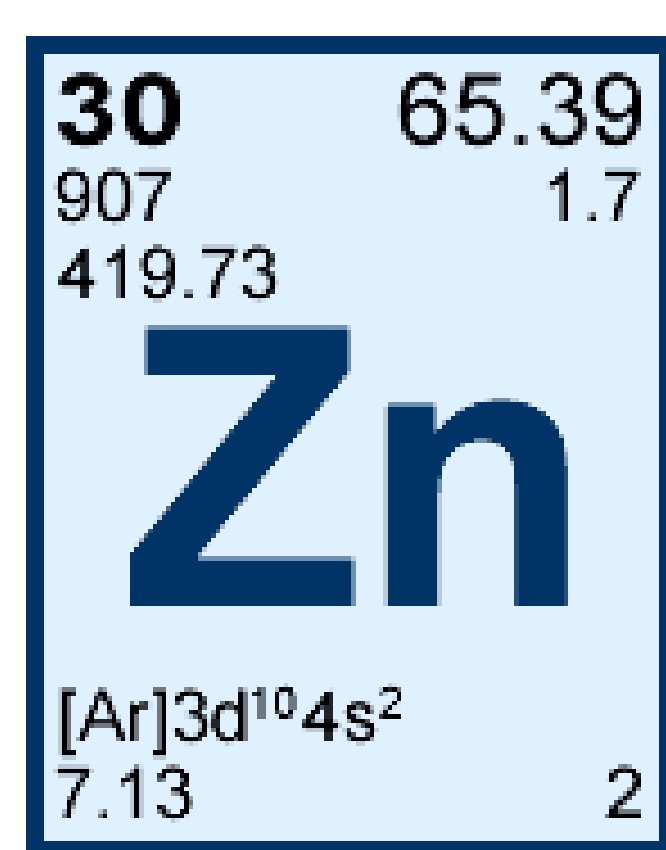
## MATERIALS AND METHODS OF STUDY

### Methods

1. Serial dilutions
2. Use of Shimadzu AA-6800 flame spectrophotometer to analyze the samples

### Materials

1. 100 mL, 50 mL, and 25 mL flasks
2. 50 mL beakers
3. Absorption spectrophotometer Shimadzu AA-6800.
4. JT Baker Zinc 1000 ppm (0.10% w/v) stock standard.
5. JT Baker Copper 1000 ppm stock standard
6. Flinn Scientific ACS Reagent 15.8 molar, assay 70% HNO<sub>3</sub>

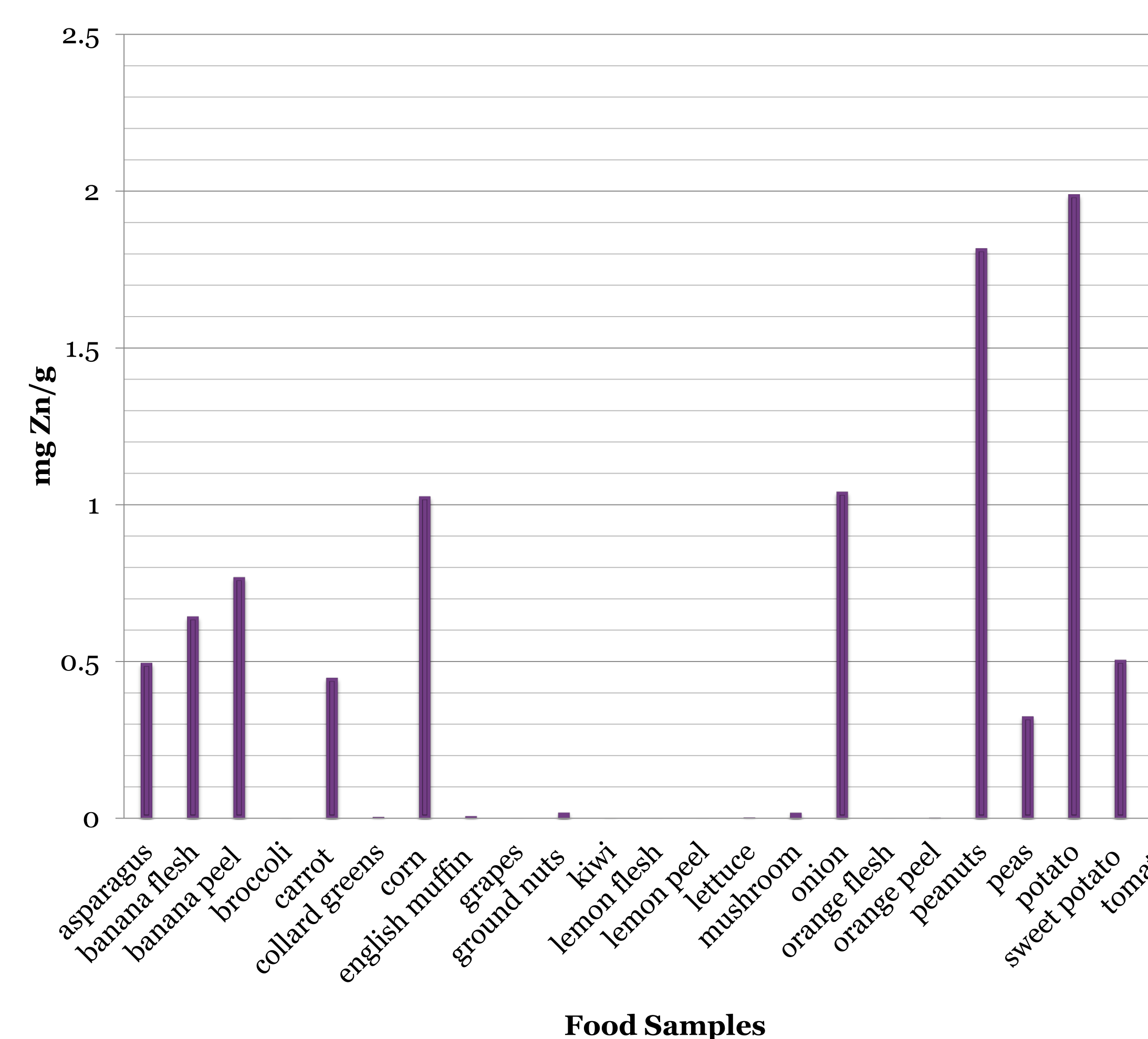
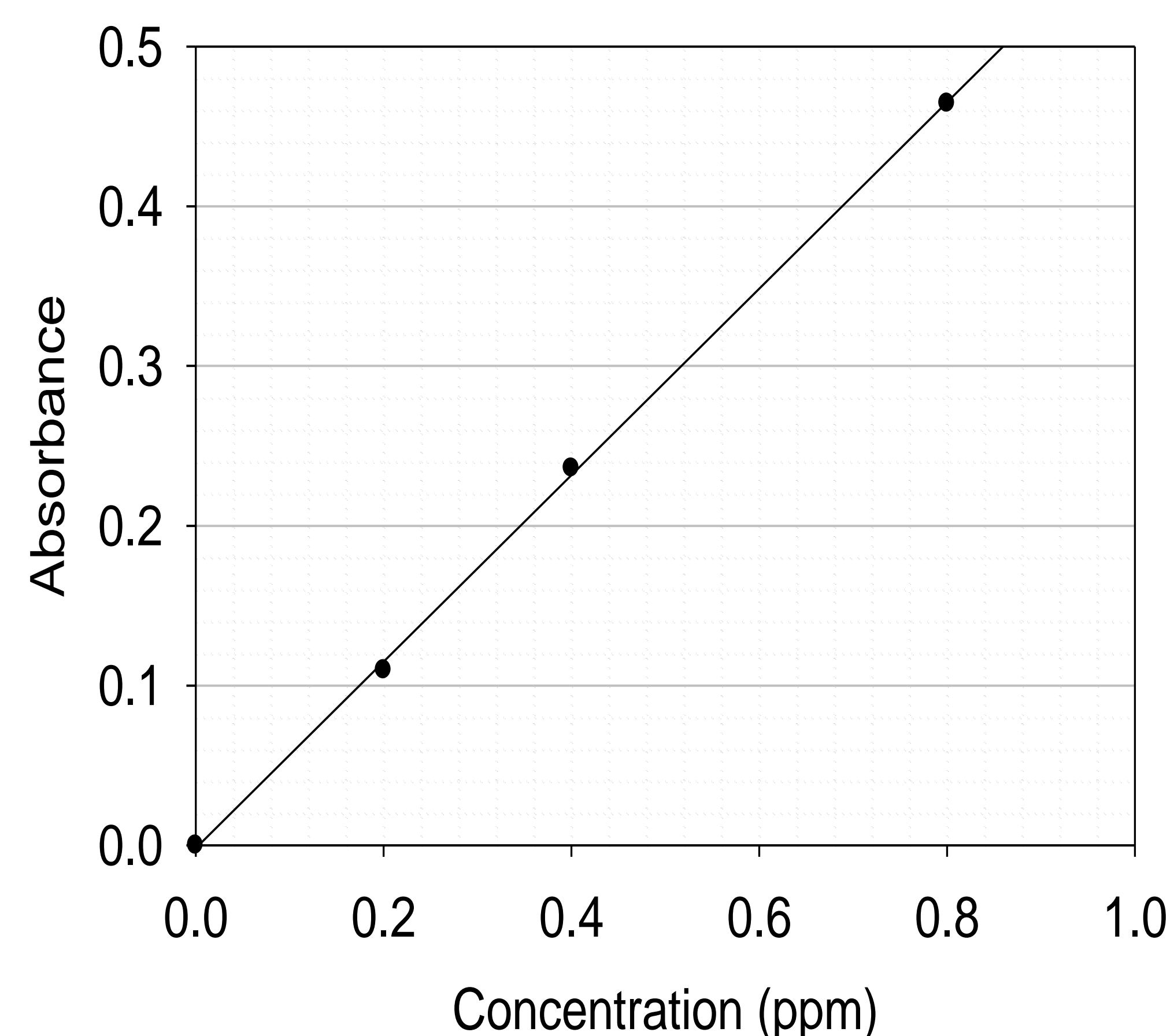


## RESULTS

### Zinc

#### A. Zinc Sample Calibration Curves

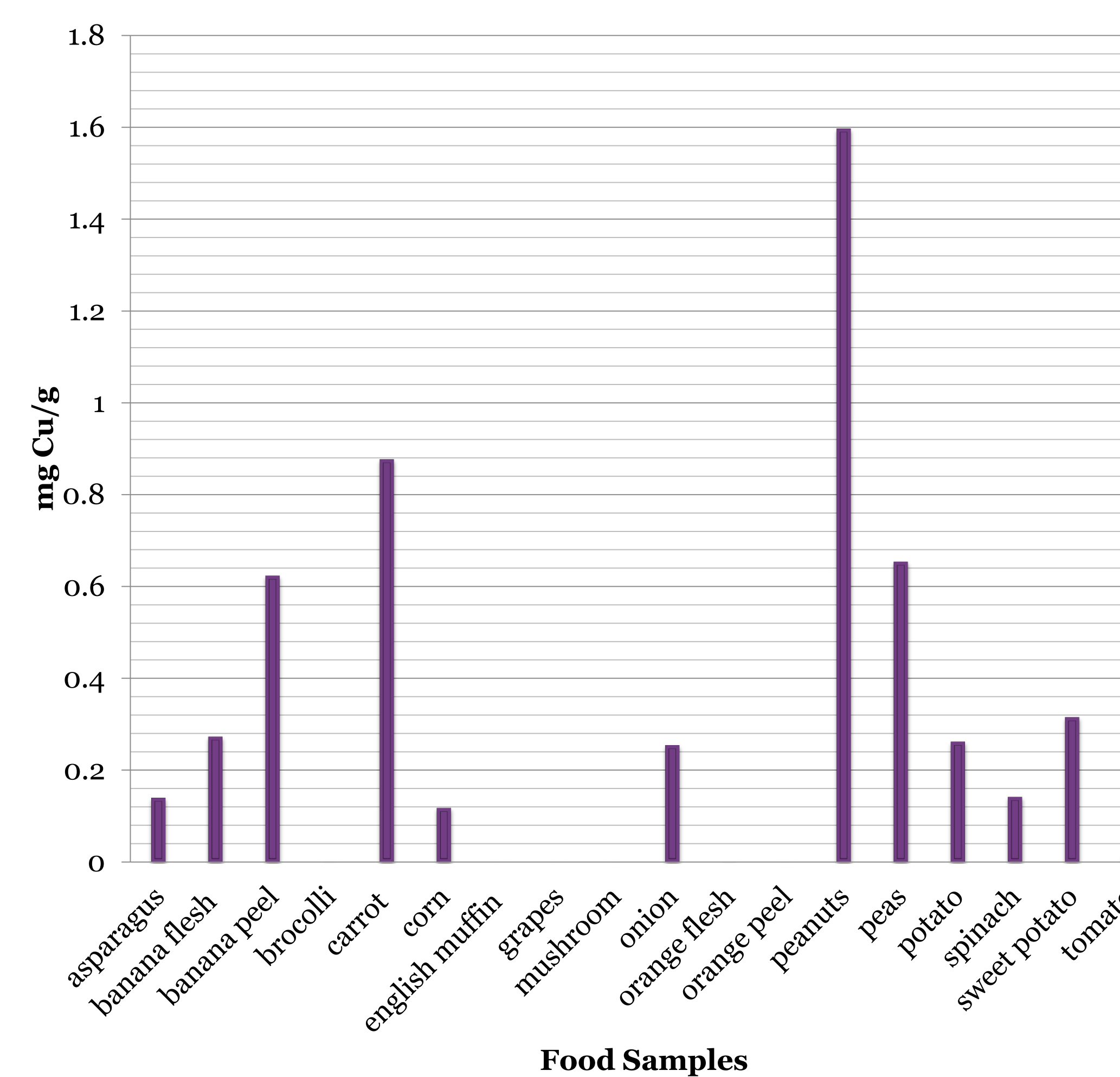
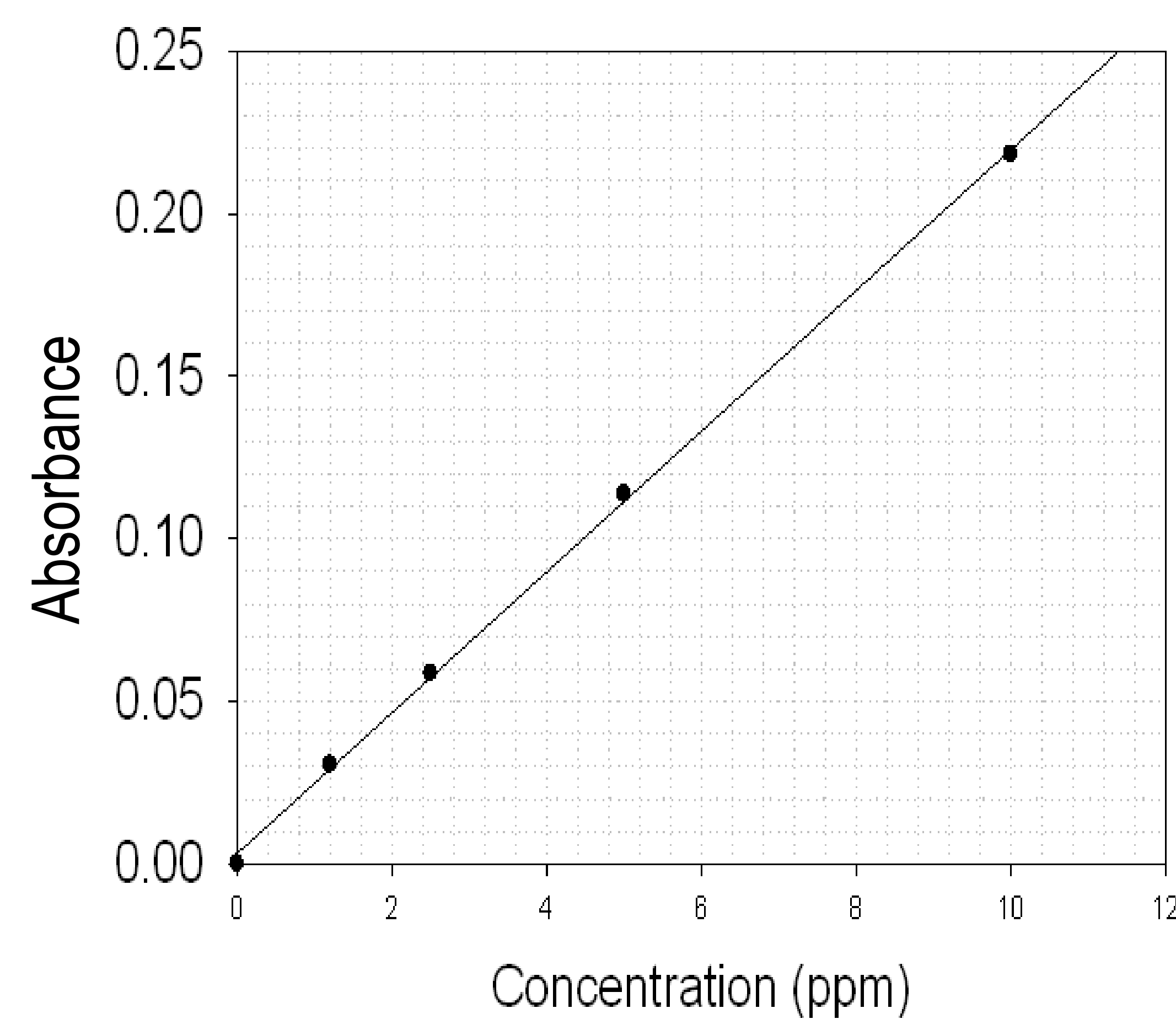
$$\text{Zinc: } \text{ABS} = 0.580714\text{Conc} + 0; R = 0.9997$$



### Copper

#### B. Copper Sample Calibration Curve

$$\text{Copper: } \text{ABS} = 0.0220983\text{Conc} + 0; R = 0.9999$$



## RECOMMENDATIONS

- Smaller dilution factors would be beneficial since AA-6800 is sensitive. This may enhance detections of low concentrations.
- Use an instrument that is more sensitive for low detectable concentrations. e.g. ICP.
- Samples should be read more than three times in order to have an accurate standard deviation.

## CONCLUSIONS

- In this research the content of Zinc and Copper were analyzed from different types of foods.
- The results consisted of a wide range of quantities in the samples. AA-6800 was used in order to further analyze the samples if they have Copper or Zinc.
- Some foods show a high quantity of Zn; for example, corn, peanuts, onion, and potato. For Cu, peanuts had a larger portion of it compared to the other samples.

### Future work:

- To analyze samples using Inductively Coupled Plasma techniques.
- Perform inter-instrumental method comparisons using various techniques.

### References:

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- Welsh, S.O and Ruth M. Marson, Trends in Levels of Zinc in the U.S. Food Supply, American Chemical Society, 1983, vol. 210, pp.15-30

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