

**APPLICATION FOR GRADUATE FOOD SCIENCE SCHOLARSHIP Page 3 of 3 – Deadline
February 5, 2019**

Use this page to provide an abstract (up to 350 words) outlining the research described in your poster. **This OUTLINE MUST BE APPROVED AND SIGNED BY THE DEPARTMENT HEAD OR MAJOR PROFESSOR.** (Note: *email notification by your advisor to Ms. Debbie Koch can be substituted for the signature*)

Sunflower flour is an industry byproduct of sunflower oil production that is traditionally disposed of or used as an ingredient in animal feed. As sunflower seeds are rich in antioxidants, it was hypothesized that this flour would be as well. The overall purpose of this study was to determine the viability of sunflower flour in the food industry. To do this, the sunflower flour was baked in a cinnamon cookie and paired with a cranberry apple butter dip. In our food research lab, we assessed (in triplicate) the antioxidant potential (determined as trolox equivalency) of the product (named Sunny Crisps and Fruity Dips), as well as three products we considered to be competition for the product (Oreo Handi-Snack, Cheese Dip and Breadstick Snacks, Teddy Grahams). We determined Sunny Crisps and Fruity Dips exhibits significantly ($\alpha = 0.05$) greater antioxidant potential than the assessed competitors, demonstrating 3-4 times greater trolox equivalency. A consumer assessment was performed with 37 participants to test likability of the developed product. On a 5-point Hedonic scale, (1= extremely dislike to 5= extremely like) panelists were asked to score the following categories; appearance, taste, aroma and overall product. The average scores were 4.1, 4.5, 4.1, and 4.5 respectively. The sensory and antioxidant data demonstrated sunflower flour to be a viable and antioxidant-rich ingredient for consideration in the development of sweet baked goods.

The above, proposed plan of research is approved and accepted.

2/4/19



Adrian Kerrihard

DATE

SIGNATURE OF DEPARTMENT HEAD OR MAJOR PROFESSOR - PRINT NAME



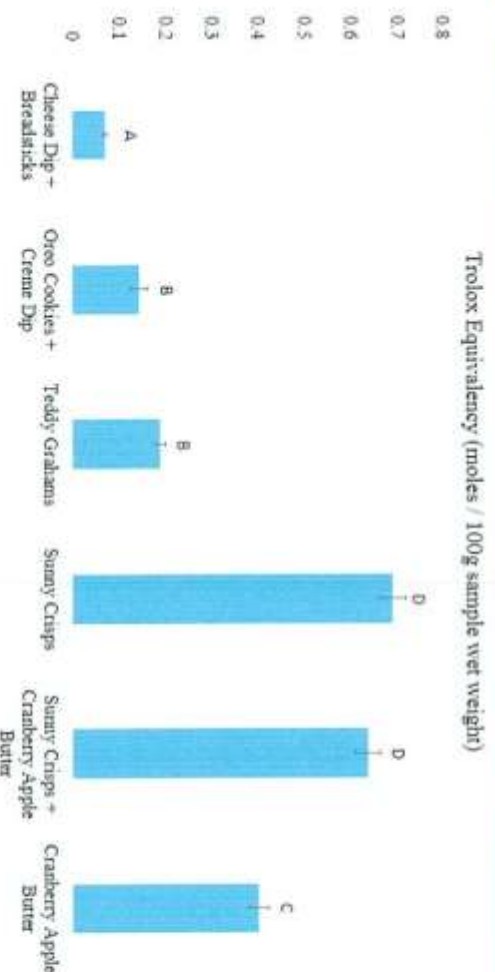
INTRODUCTION

Sunflower flour is an industry byproduct of sunflower oil production that is traditionally disposed of or used as an ingredient in animal feed. As sunflower seeds are rich in antioxidants, it was hypothesized that this flour would be as well. The overall purpose of this study was to determine the viability of sunflower flour in the food industry. To do this, the sunflower flour was baked in a cinnamon cookie and paired with a cranberry apple butter dip.

MATERIALS & METHODS

Sunflower flour was substituted for 25% brown rice flour in an existing cinnamon cookie recipe, and additional formula modifications were made by a product development team to achieve a desirable sensory quality. Following prototype development, consumer assessment tests were performed to analyze the likability of the product. The consumer assessment asked each panelist (n = 37) to rate the product (named “Sunny Crisps and Fruity Dips”) on a 5-point Hedonic scale (1 = extremely dislike to 5 = extremely like) for the attributes of appearance, taste, aroma and overall product. A Trolox Equivalent Antioxidant Capacity (TEAC) Assay was performed in triplicate to analyze the antioxidant potential of the sunflower flour-rich product versus possible industry competitors. This assay assesses the sample’s capacity to neutralize a radical standard (DPPH) compared to a standard curve of Trolox. The loss of absorbance at 517 nm was measured in a microplate reader after 30 minutes of incubation at 27°C. Samples were lyophilized prior to antioxidant assessment.

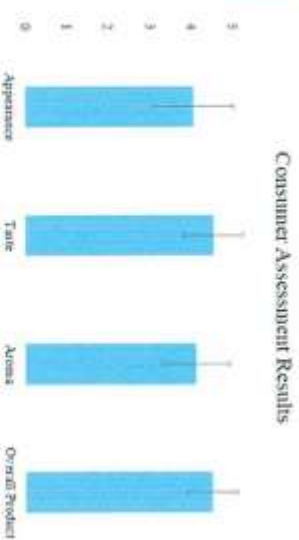
RESULTS AND DISCUSSION



Sample bars with the same letter above are not significantly different ($\alpha = 0.05$)

It was determined that the sunflower flour product exhibits significantly ($\alpha = 0.05$) greater antioxidant potential than the assessed competitors (Oreo Handi-Snack, Cheese Dip and Breadstick Snacks, Teddy Grahams) demonstrating 3-4 times greater trolox equivalency.

The sunflower flour product had average scores of 4.1, 4.5, 4.1, and 4.5 on the following categories; appearance, taste, aroma and overall, respectively.



N=37, 1= extremely dislike to 5= extremely like

CONCLUSION

The sensory and antioxidant data demonstrated sunflower flour to be a viable and antioxidant-rich ingredient for consideration in the development of sweet baked goods.