

Exploring the Association in Bitter Taste Sensitivity with a Breast Cancer Diagnosis



Abigail Lipani, MS; Stefany Primeaux, PhD

Department of Physiology, Louisiana State University Health Sciences Center - New Orleans

Introduction

- Antioxidants are compounds that aid in neutralizing free radicals, whose harmful effects on the body may contribute to the development of cancer.
- Foods that are rich in antioxidants are often bitter-tasting and individuals with a high sensitivity to bitter taste may avoid these nutrient-dense foods.
- The TAS2R gene family is largely responsible for the genetic variations in bitter taste perception.
- Studies have hypothesized that a reduction in dietary intake of antioxidants due to a heightened sensitivity to bitter taste may increase cancer risk, although further exploration is needed to understand the link between bitter taste perception and cancer.

Purpose

- The current study seeks to investigate the relationship between bitter taste sensitivity and incidence of breast cancer in adult females, by determining food preferences, sensitivity to bitter tastes and taste bud density.

Methods

- Participants were recruited from the Surgery Department at the Baton Rouge Clinic.
- Each participant was asked questions related to demographics, factors that could impact taste sensitivity, breast cancer diagnosis and treatment and asked to rate their liking of various common foods.
- Participants were asked to report their taste perception for bitter compound taste using strips for phenylthiourea (PTC).
- Participants were classified as either tasters or non-tasters based on their response to PTC.
- The fungiform papillae were counted from a small portion on the tip of the tongue.

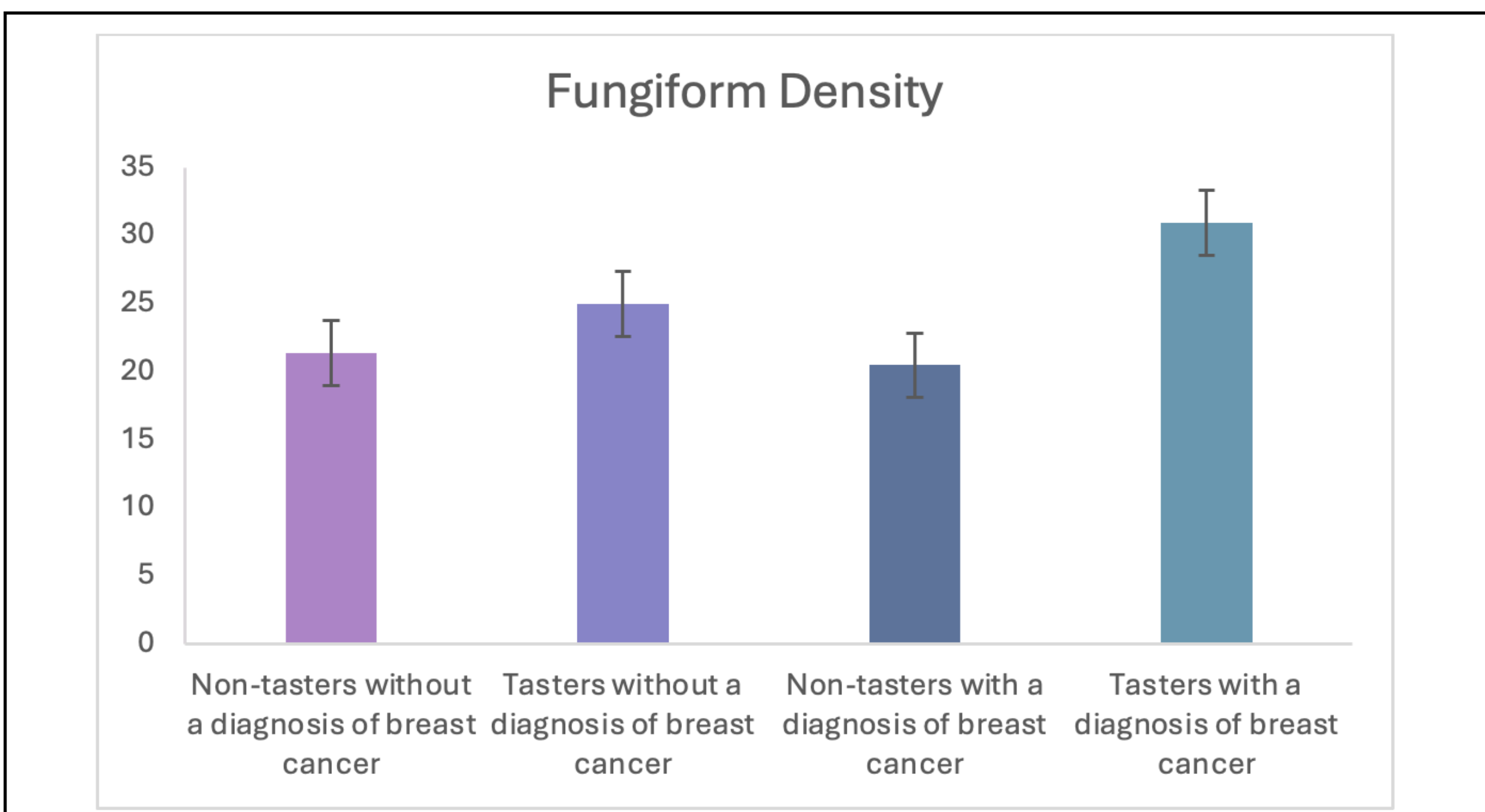
Demographics

Table 1.

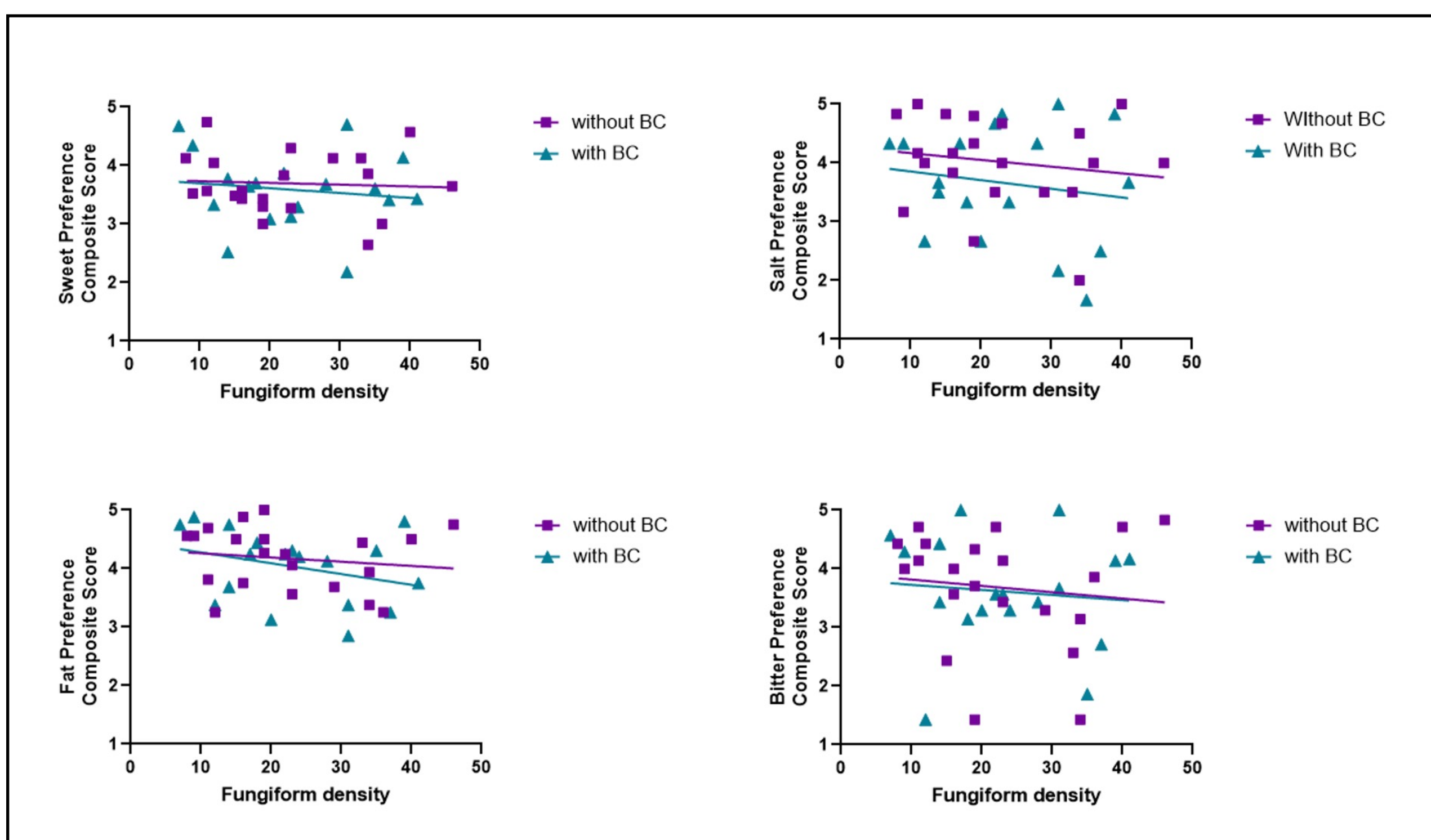
	ALL participants n=39	Without a diagnosis of breast cancer n=21	With a diagnosis of Breast Cancer n=18	p-value
Age, y	59.9 ± 19.5	50.9 ± 19.0	70.6 ± 14.1	p<0.001*
Race, % (n)				p=0.801
Black or African American	20.5 (8)	19.0 (4)	22.2 (4)	
White	79.5 (31)	81.0 (17)	77.8 (14)	
Anthropometrics				
Body Mass Index (BMI)	29.0 ± 6.9	29.5 ± 7.8	28.5 ± 5.8	p=0.673
Reproductive Status				p<0.05*
Pre-menopausal, % (n)	17.9 (7)	28.6 (6)	5.6 (1)	
Peri-menopausal, % (n)	7.7 (3)	14.3 (3)	0.0 (0)	
Post-menopausal, % (n)	71.8 (28)	52.4 (11)	94.4 (17)	
Smoking/Vaping status				p=0.085
Never, % (n)	76.9 (30)	90.5 (19)	61.1 (11)	
Previously, % (n)	15.4 (6)	4.8 (1)	27.8 (5)	
Currently, % (n)	7.7 (3)	4.8 (1)	11.1 (2)	
Breast Cancer Diagnosis				
Years since diagnosis	-	-	6.7 ± 5.9	-
Undergone chemotherapy, % (n)	-	-	33.3 (6)	p=0.748
Years since last chemotherapy	-	-	6.4 ± 5.8	-
Bitter Taster (PTC), % (n)	56.4 (22)	52.4 (11)	61.1 (11)	p=0.584
Other factors				
Currently taking antibiotics, % (n)	7.7 (3)	9.5 (2)	5.6 (1)	p=0.643
Currently taking allergy meds, % (n)	30.8 (12)	28.6 (6)	33.3 (6)	p=0.748
Diagnosis of dry mouth, % (n)	20.5 (8)	19.0 (4)	22.2 (4)	p=0.245
Routine dental cleanings, % (n)	92.3 (36)	95.2 (20)	88.9 (16)	p=0.458

Values are means ± SDs unless otherwise indicated. * Indicates significant differences between participants with and without a diagnosis of breast cancer.

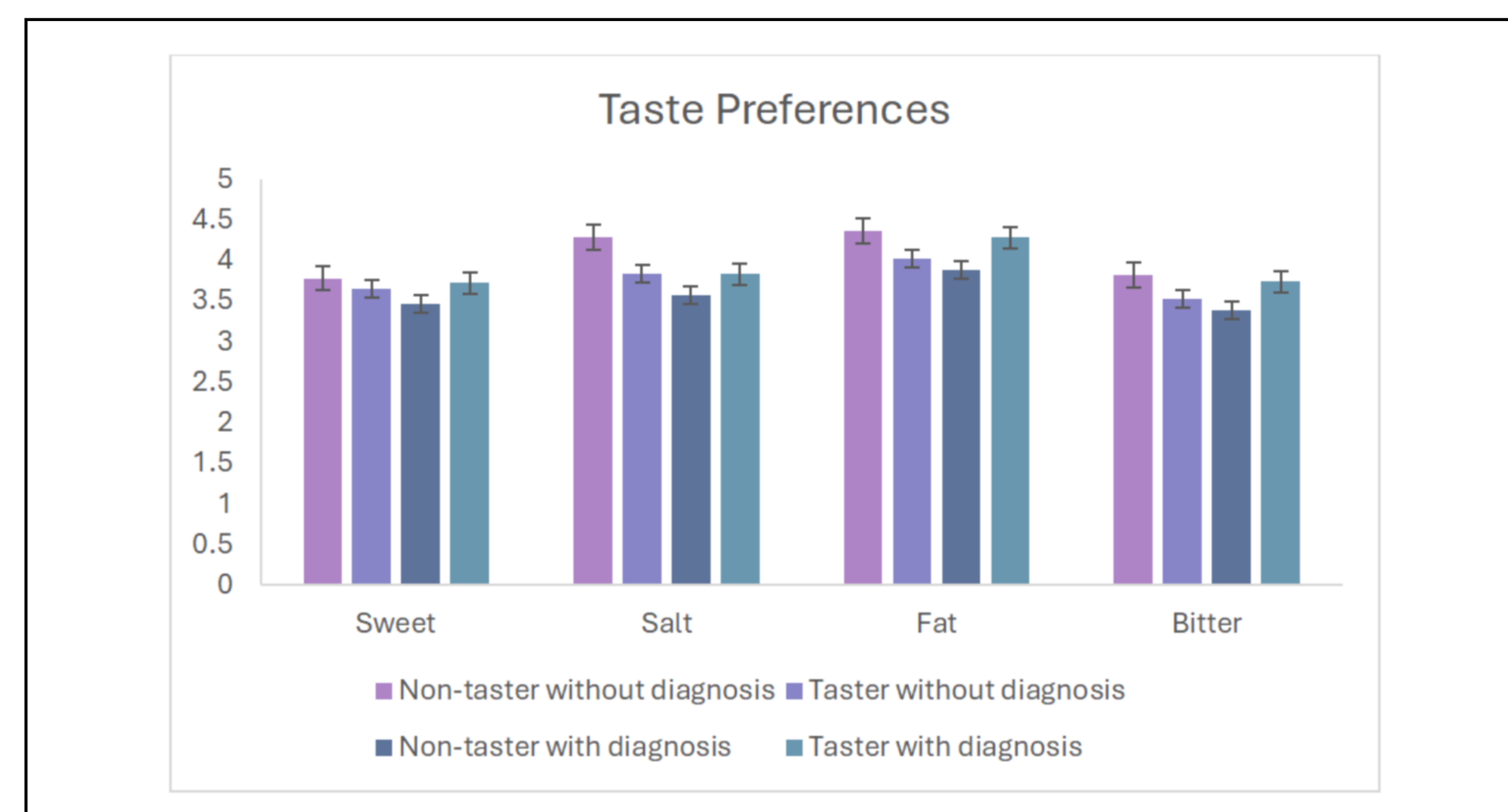
Fungiform Density



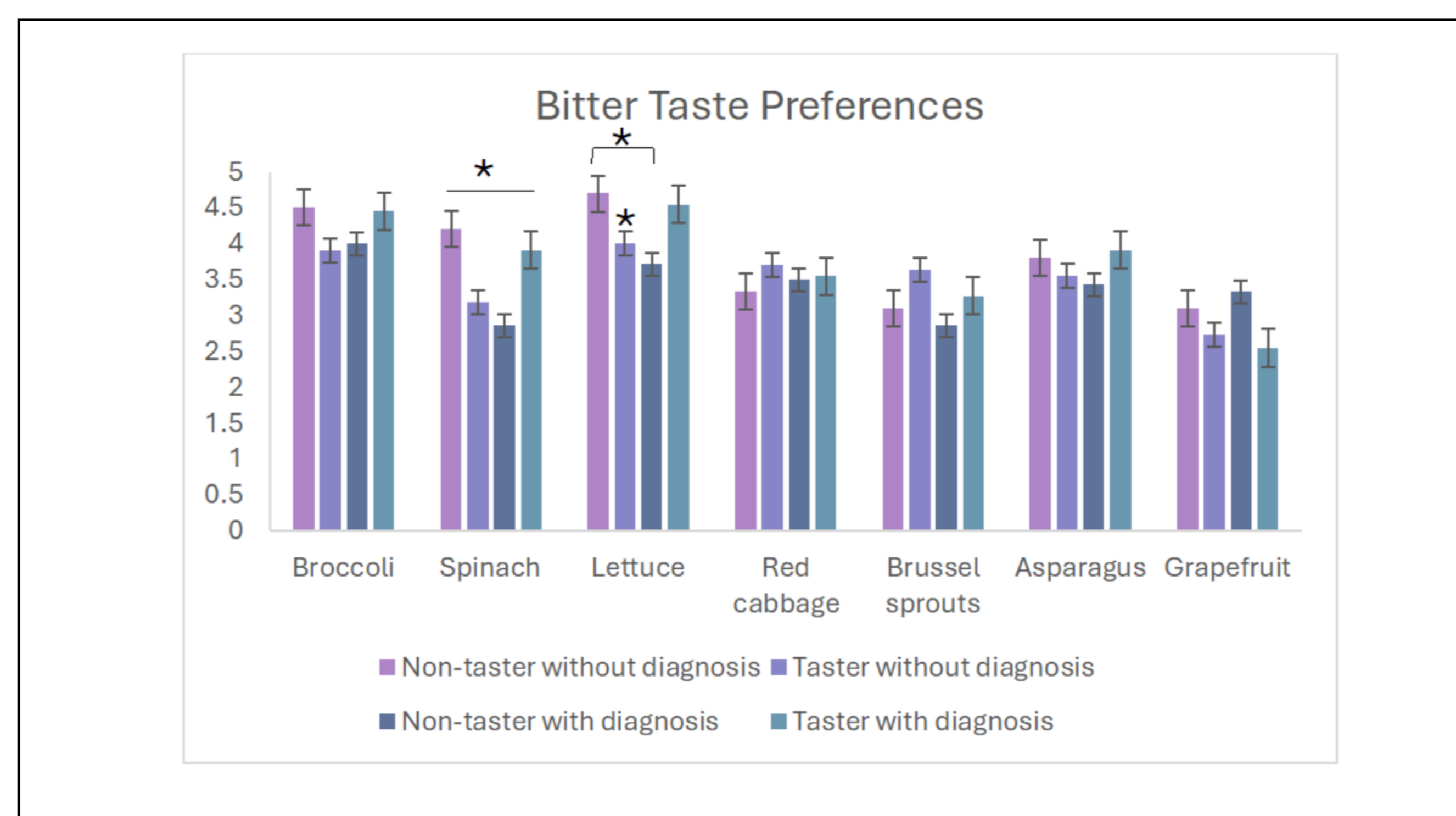
Fungiform Density and Taste



Taste Preferences



Bitter Taste Preferences



Discussion

- Participants with a breast cancer diagnosis were significantly older than those without a breast cancer diagnosis (70.6 ± 14.1 years and 50.9 ± 19.0 years, respectively).
- 28% of participants with a diagnosis of breast cancer and 33% of participants without a diagnosis were supertasters.
- There was a significant interaction between diagnosis and taster status for the fat preference composite score, with the non-tasters from the two groups showing differences. In the no diagnosis group, tasters differed from non-tasters.
- A significant interaction between diagnosis and taster status was observed for lettuce, with differences noted among non-tasters in the two groups.
- This study is actively enrolling participants. Efforts to expand participation are currently underway.