



Associations Between Ultra-processed Food Intake and Gut Microbiome Composition in Young Adults

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Background

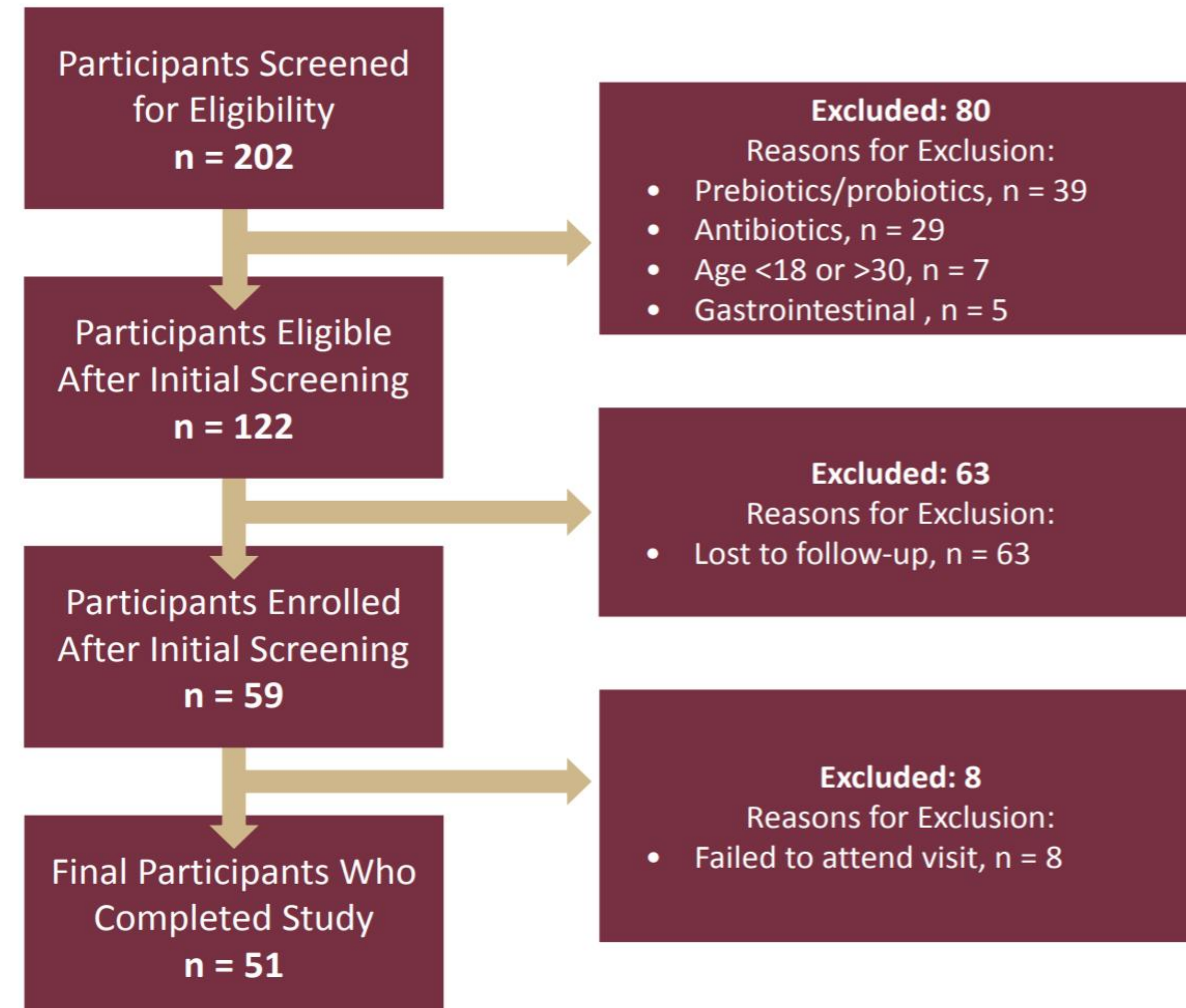
Ultra Processed Foods (UPFs): Industrial food formulations made primarily from refined ingredients and additives rather than whole foods. Examples include packaged snacks, sugar sweetened beverages, reconstituted meats, and ready to eat meals.

- UPFs make up a large proportion of energy intake among college aged adults, where convenience, cost, and campus food environments often promote highly processed dietary patterns.
- UPFs may reduce gut microbial diversity and shift microbial composition toward taxa linked with inflammation and metabolic dysfunction.
- The gut microbiome influences metabolism, immune regulation, and gut barrier function. Dietary patterns established in early adulthood may shape microbial composition and long-term health outcomes.

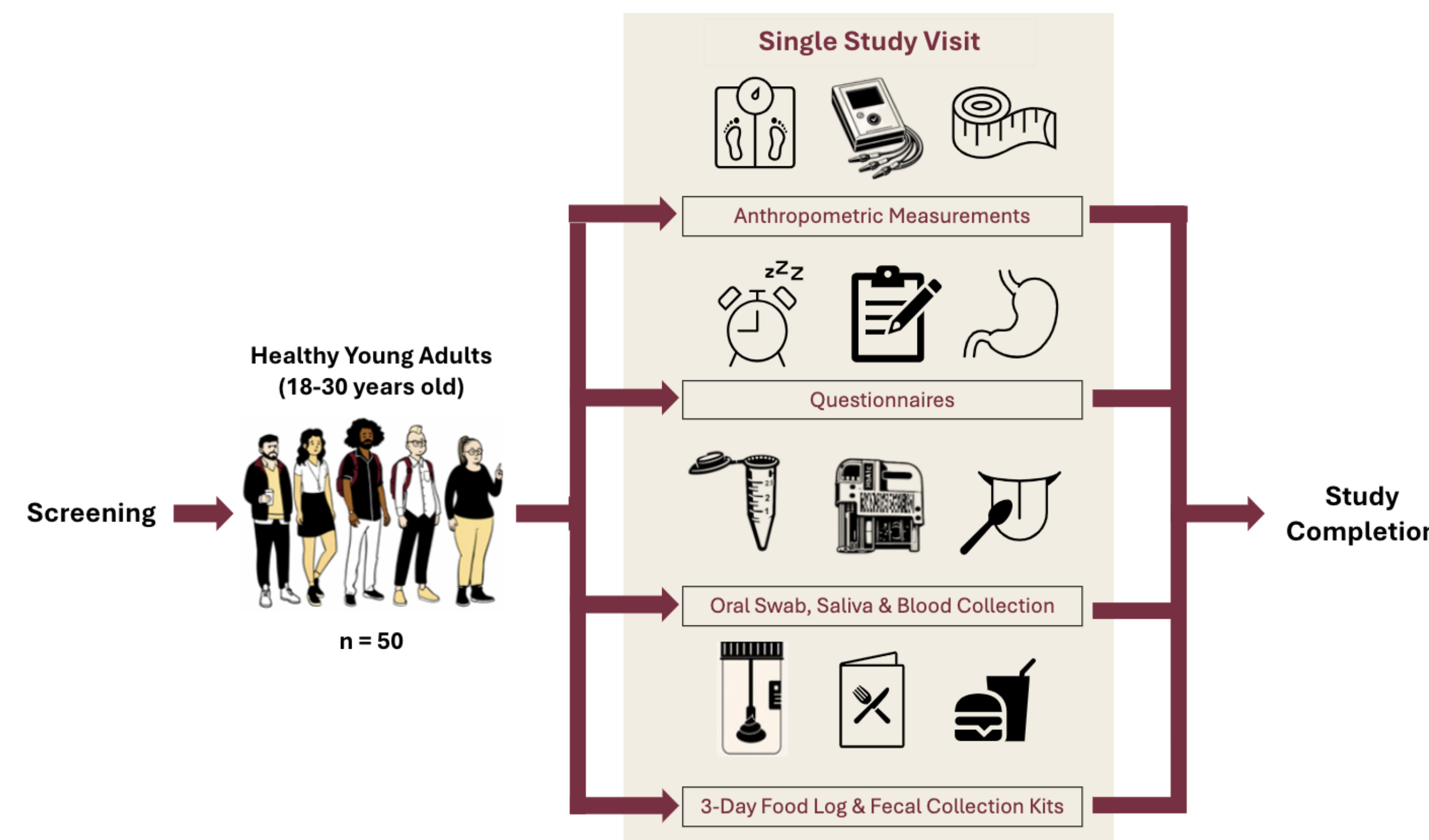
Research Objectives

The primary objective of this study is to examine associations between UPF intake, classified using the NOVA system, and markers of gut health in college aged adults.

Participant Recruitment



Study Design



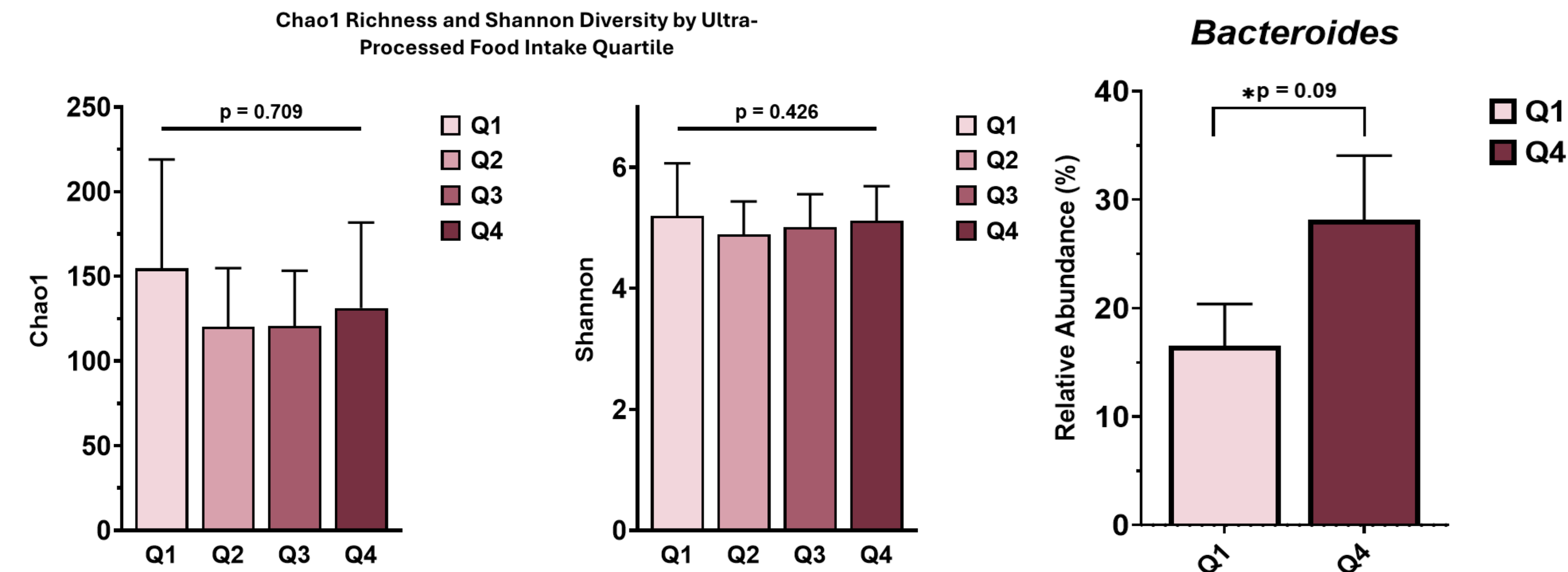
Participant Characteristics

Table 1: Demographic and Clinical Characteristics of Participants by UPF Quartile (n = 51)^{1,2}

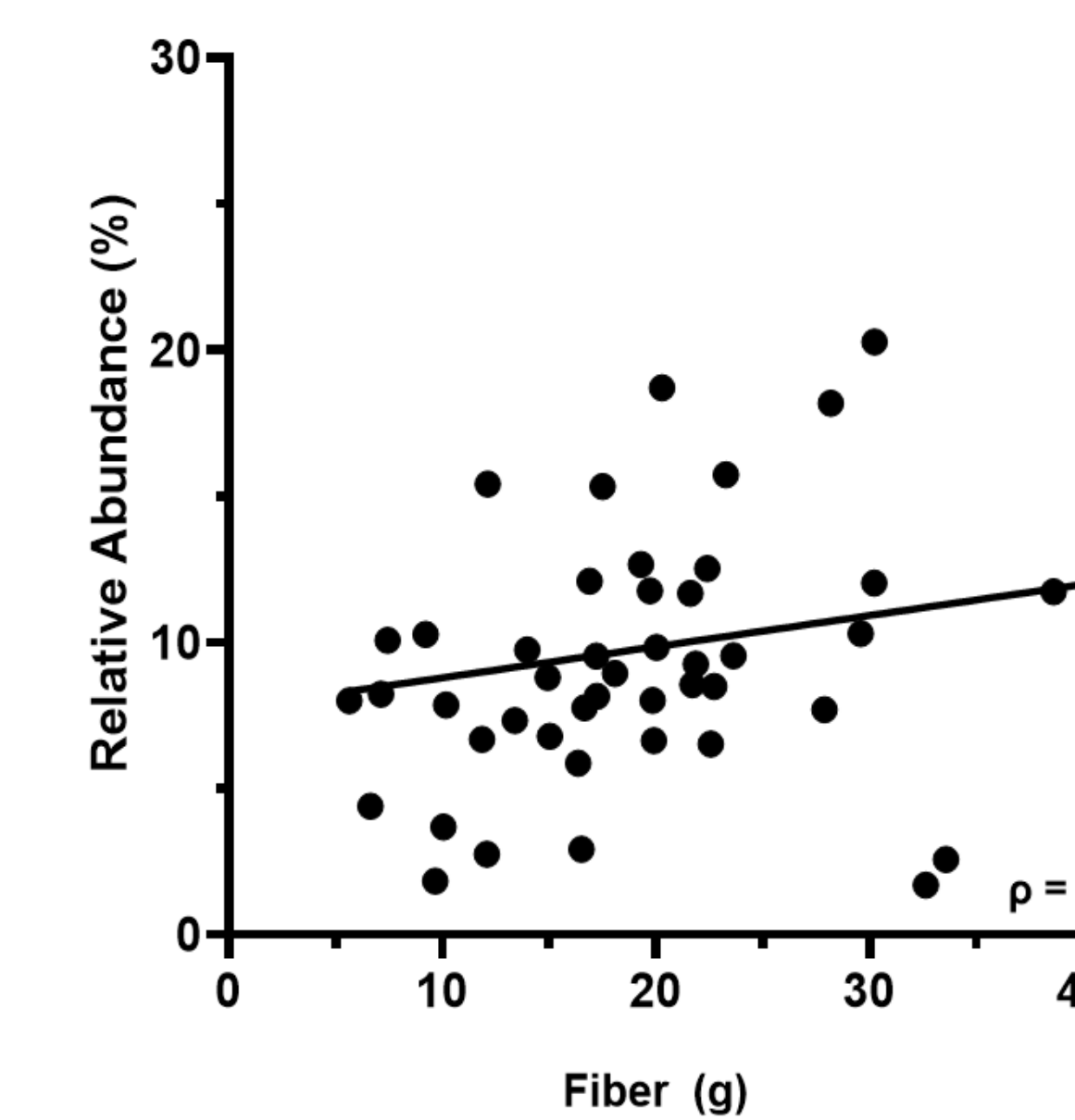
Variable	Q1 (n = 14)	Q2 (n = 12)	Q3 (n = 13)	Q4 (n = 12)	P value ^a	Effect Size (η ² or V) ^b
Age (years)	23.3 ± 3.9	20.0 ± 2.6	20.4 ± 2.2	20.8 ± 3.9	0.10	0.15
Sex, n (%)					0.464	0.23
Male	5 (35.7)	2 (16.7)	6 (46.2)	5 (41.7)		
Female	9 (64.3)	10 (83.3)	7 (53.8)	7 (58.3)		
Race, n (%)					0.403	0.36
White	6 (42.9)	5 (41.7)	9 (69.2)	4 (33.4)		
Black	1 (7.1)	0 (0)	1 (7.7)	4 (33.3)		
Asian	4 (28.6)	2 (16.7)	1 (7.7)	2 (16.7)		
Hispanic	3 (21.4)	5 (41.6)	2 (15.4)	2 (16.6)		
Education, n (%)					0.06	0.35
High School or Less	0 (0)	1 (8.3)	0 (0)	0 (0)		
Some College	5 (35.7)	8 (66.7)	12 (92.3)	10 (83.3)		
Undergraduate Degree	3 (21.4)	2 (16.7)	0 (0)	0 (0)		
Graduate Degree	6 (42.9)	1 (8.3)	1 (7.7)	2 (16.7)		
Body Mass Index (kg/m ²)	24.8 ± 7.9	23.8 ± 4.6	26.9 ± 9.4	27.3 ± 4.2	0.565	0.04

¹Data are presented as mean ± SD for continuous variables and n (%) for categorical variables.
²UPF intake quartiles were defined based on the percentage of total energy derived from ultra-processed foods using the NOVA classification system.
³Data only available for n = 11 in Q1, n = 10 in Q2, n = 11 in Q3, and n = 8 in Q4.
^aContinuous variables were compared using one-way ANOVA or Welch's analyses of variance as appropriate, and categorical variables using chi square tests.
^bEffect sizes are reported as eta squared (η²) and Cramér's V for chi square tests.

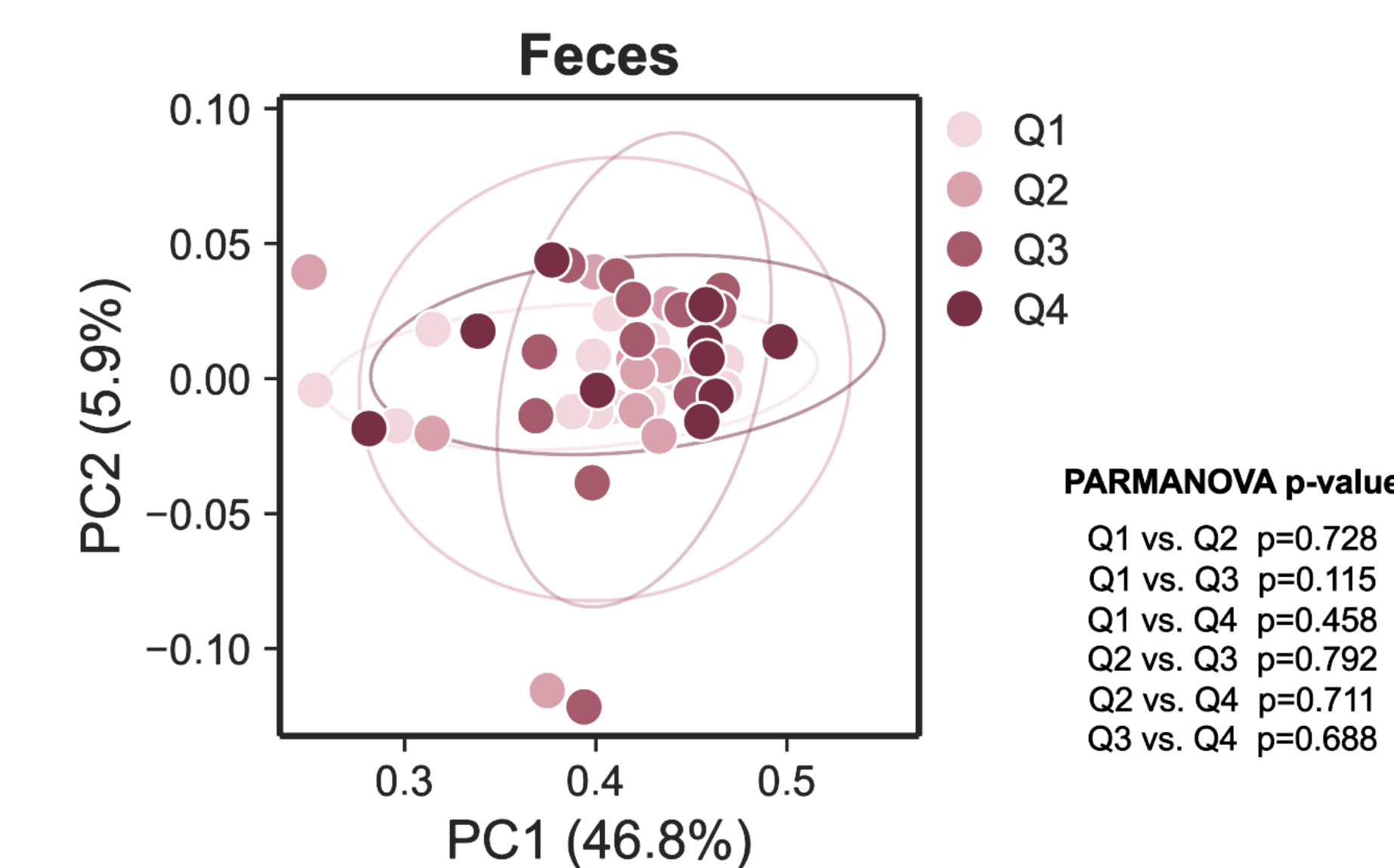
Results



Association Between Dietary Fiber Intake and Relative Abundance of *Lachnospiraceae*



Gut Microbial Beta Diversity Across Ultra-Processed Food Intake Quartiles



Conclusion

- UPF intake was **not associated** with significant differences in overall **microbial diversity** or **community composition** in this sample of college aged adults.
- Higher UPF intake showed a **trend toward increased relative abundance** of *Bacteroides*, a genus commonly associated with **Western dietary patterns** high in fat and refined carbohydrates.
- Greater dietary fiber intake was **positively associated** with *Lachnospiraceae*, a family of **fiber fermenting bacteria** that produce short chain fatty acids such as butyrate that **support gut barrier integrity** and metabolic health.
- These findings suggest that dietary composition may influence specific microbial taxa even when overall community diversity remains unchanged.

Key References



Literature Review



The Gut Biome Lab @ FSU