# Tracking Body Composition Changes in Cal Poly Students Pre- and Post-COVID: A DXA Comparison with National NHANES Data

**CAL POLY**
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## How does the fat mass and fat-free mass of healthy college students at Cal Poly SLO, as measured by DXA, compare to national NHANES data, and what factors may contribute to any observed differences?

## INTRODUCTION:

- Evaluating body composition has become an important resource in predicting health status and overall physical condition within the United States.[1]
- Body Mass Index (BMI) measures body composition based on height and weight.[3]
- BMI has considerable limitations in capturing true health status, particularly when differentiating fat mass from fat-free mass.[3]
- Dual-Energy X-ray Absorptiometry (DXA) is considered the gold standard for measuring body composition.[2]
- By utilizing DXA, we can evaluate health status of Cal Poly Students more comprehensively.[2]

## OUR HYPOTHESIS:

- Cal Poly students will have fat mass percentages equal to or lower than NHANES reference values for their age group.
- We expect the university's active, fitness-oriented culture to contribute to healthier body composition profiles.
- Despite variations in BMI, students' fat mass and fat-free mass distributions will align with or exceed national health standards

## METHODOLOGY:

- DXA scans were conducted on 479 Cal Poly students who were 18-26 years old at the time of the scan.
- The scans measured fat mass, fat-free mass, and BMI classifications.
- These metrics were compared with NHANES data for similar age groups.
- The comparison aimed to identify differences and trends.

## RESULTS/FINDINGS:

- Cal Poly students had ~6% lower fat mass compared to NHANES reference values.
- Female Cal Poly Students Pre-Covid averaged 30.08% body fat
- Male Cal Poly Students Pre-Covid averaged 19.00% body fat
- Female NHANES participants averaged 37.75% body fat
- Male NHANES participants averaged 25.32% body fat
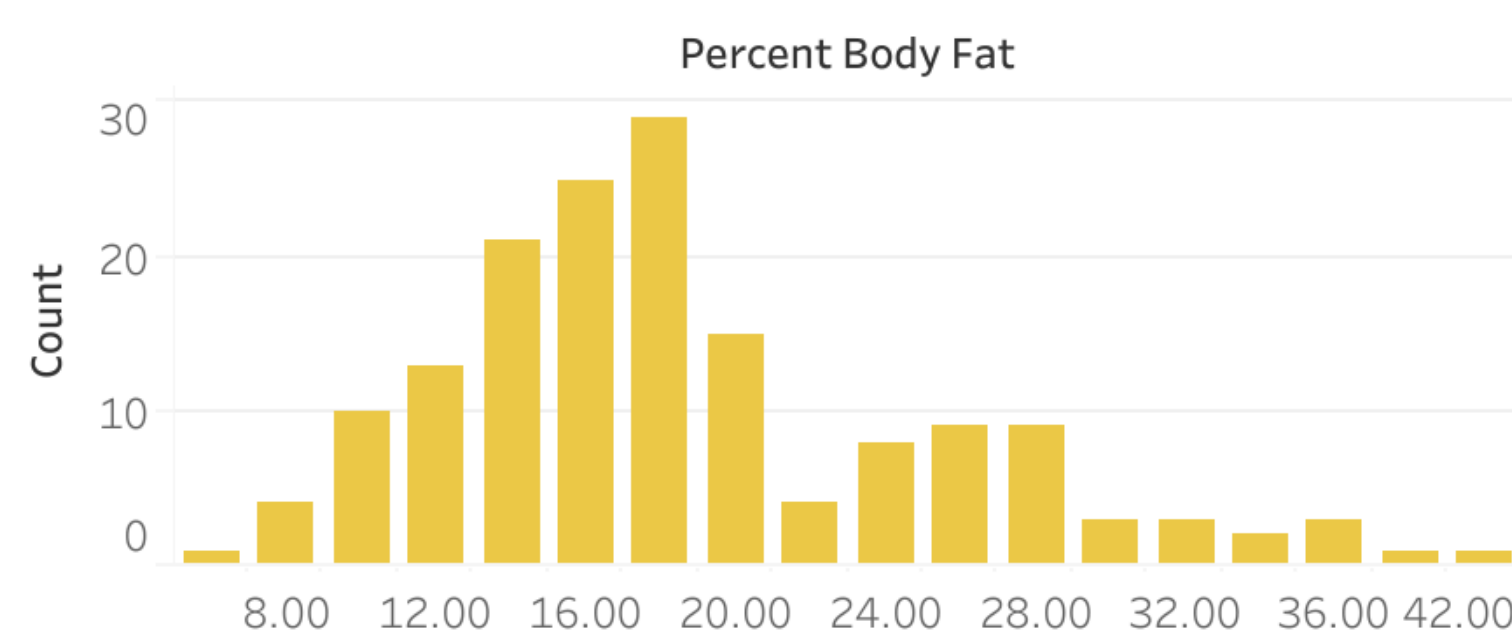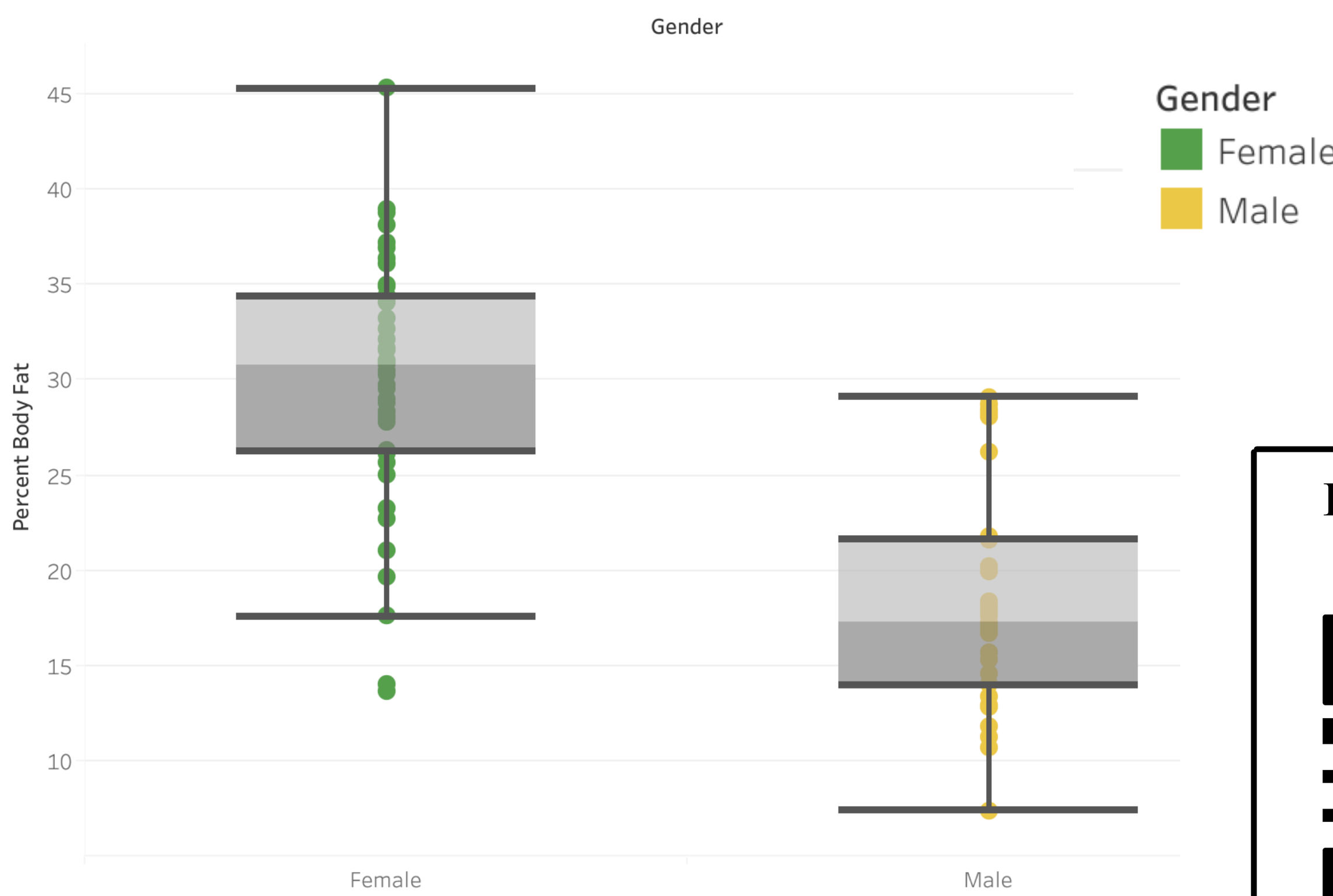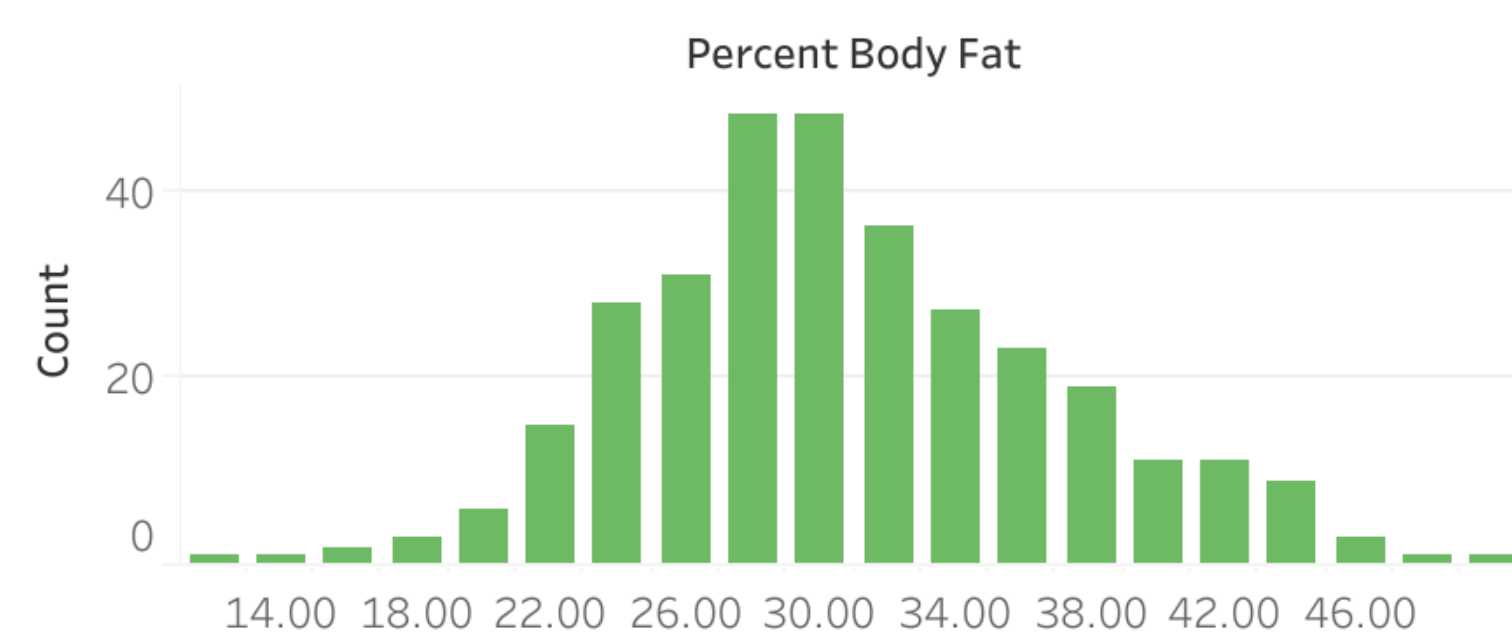- The standard deviation in the NHANES data is 7%

NHANES Males — Percent Body Fat

NHANES Females — Percent Body Fat

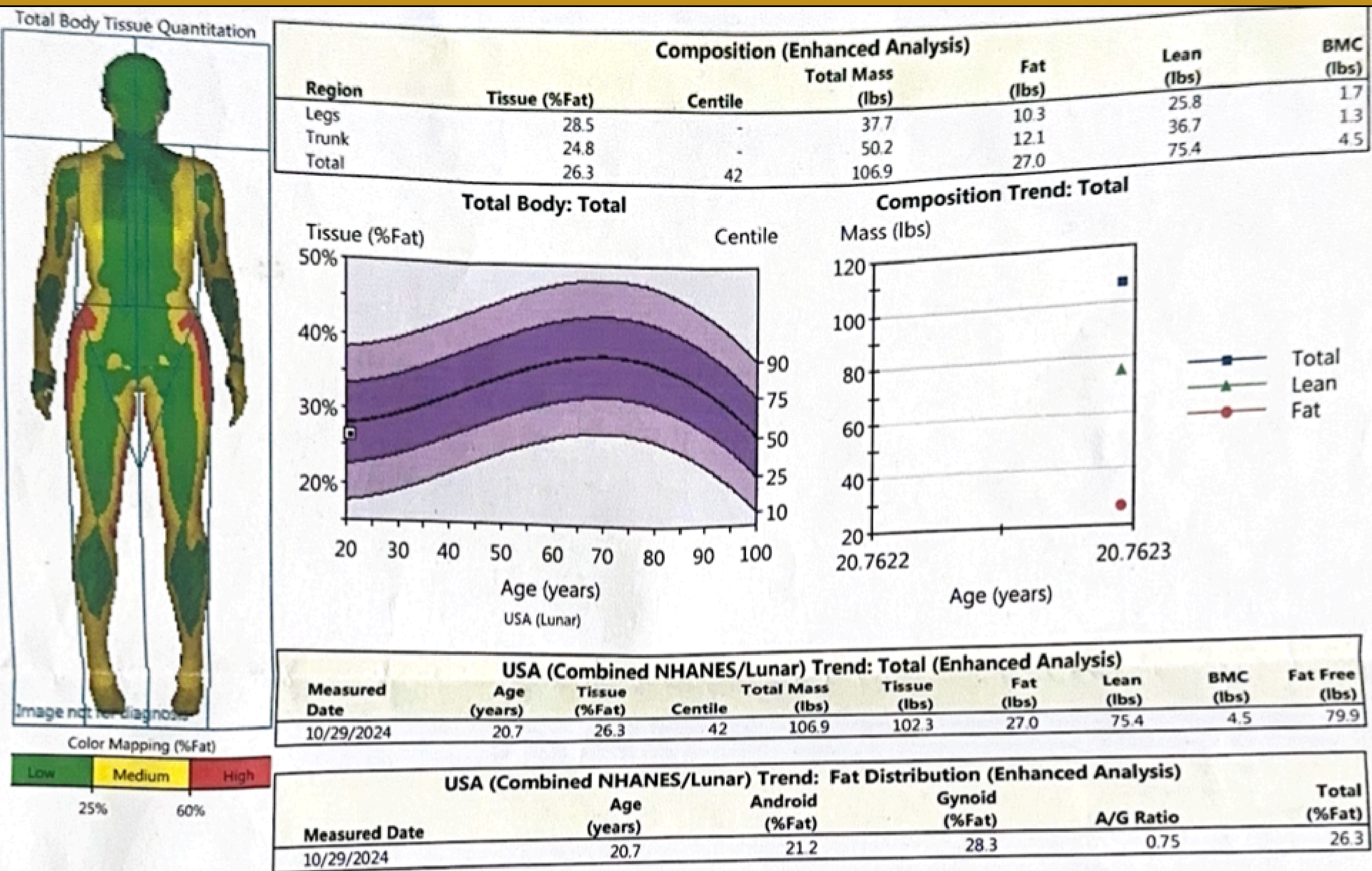Cal Poly Males — Percent Body Fat
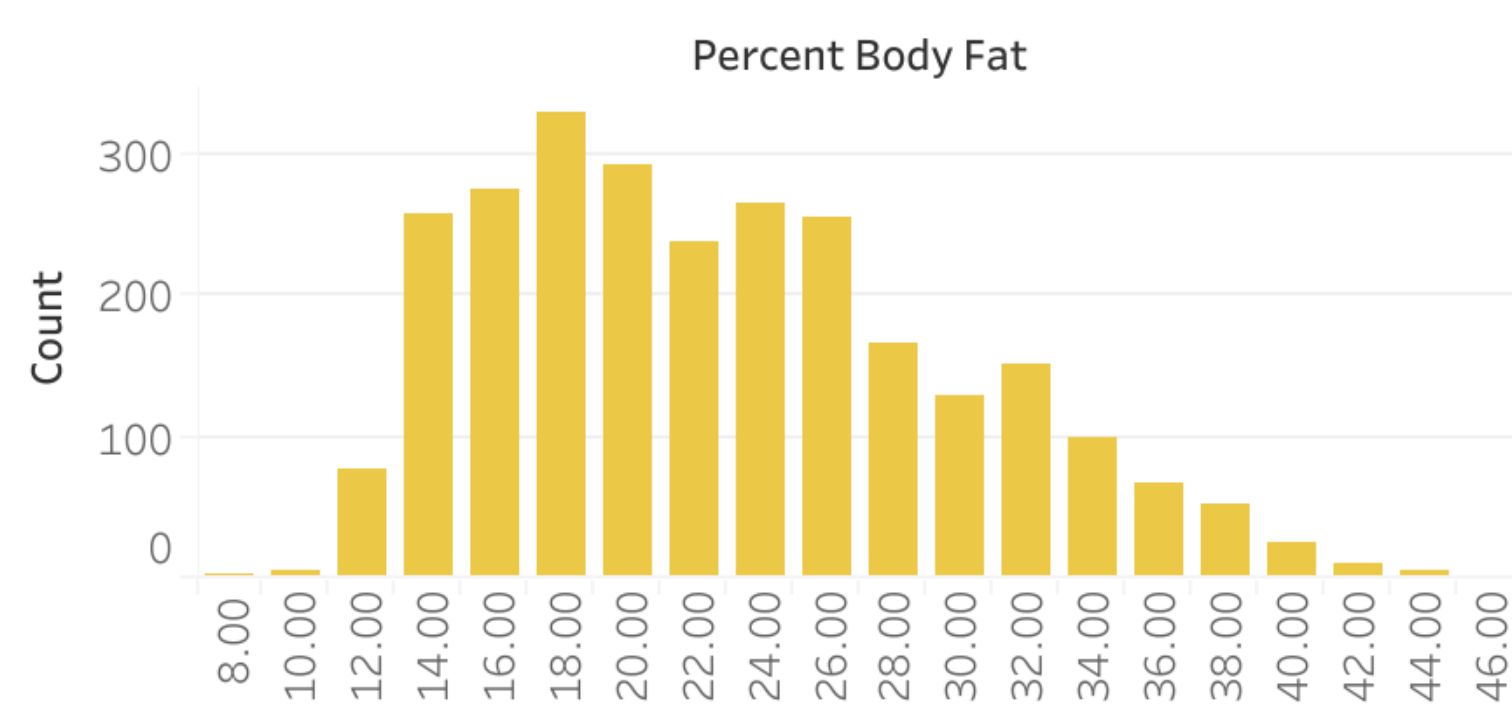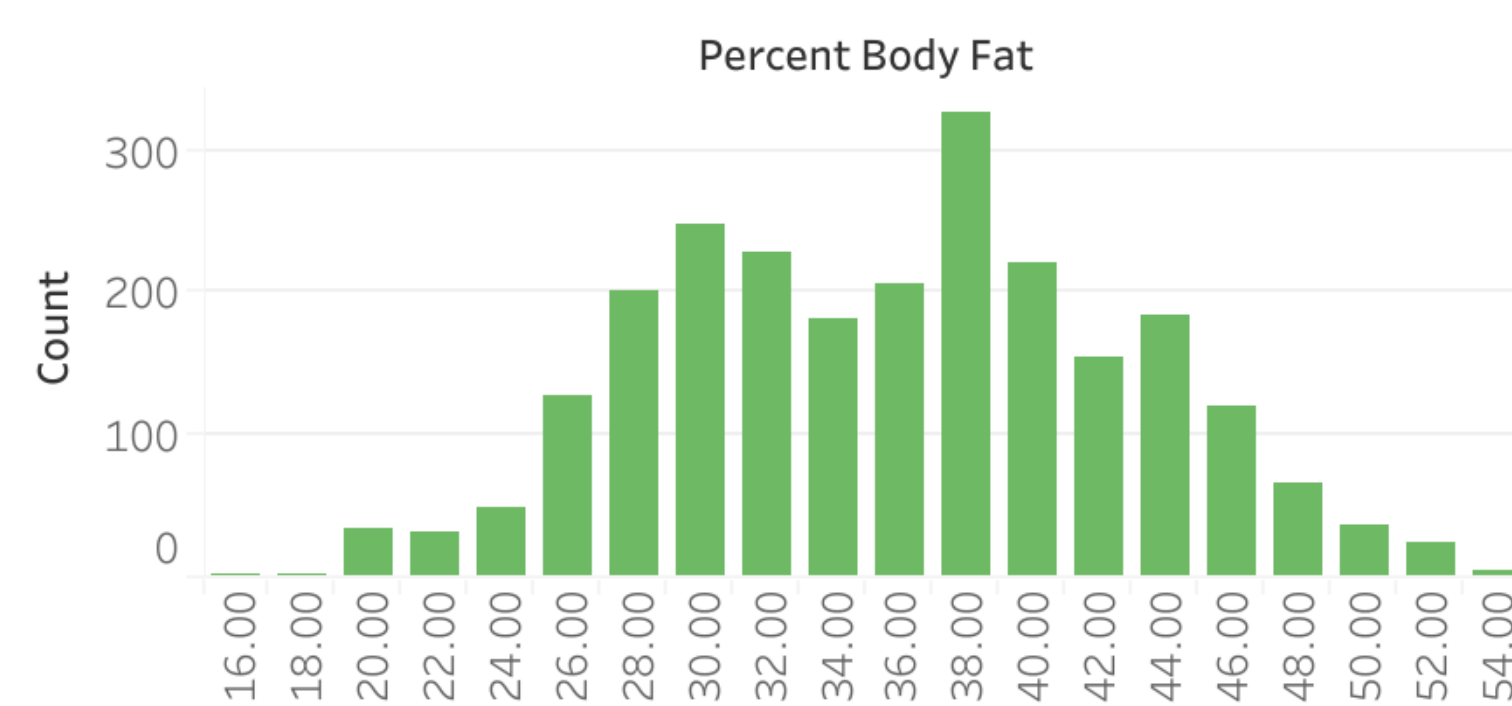
Cal Poly Females — Percent Body Fat

Gender

**Cal Poly Body Fat Percentage by Gender (Pre-Covid)**

**For More Graphs With Data:**

## ANALYSIS:

- COVID-19 inhibited physical activity while increasing sedentary behaviors, contributing to the increase of fat mass and decline in muscle mass, thus increasing obesity rates on a national level.
- Despite a 3% increase in fat mass Post-Covid, Cal Poly students still exhibit body fat percentages a standard deviation below NHANES reference values.
- The disconnect of a healthy BMI and changing body composition encourages the need for more research to determine whether the Cal Poly fat mass levels will return to Pre-Covid standards for the area.

## CONCLUSION

The study findings highlight a significant discrepancy in fat mass percentages among Cal Poly students compared to NHANES references. This suggests that despite normal BMI classifications, the university's demographic shows lower fat accumulation, potentially influenced by lifestyle factors and cultural norms. Further research is needed to understand these disparities fully.

1. FRANK, A. P., DE SOUZA SANTOS, R., PALMER, B. F., & CLEGG, D. J. (2019). DETERMINANTS OF BODY FAT DISTRIBUTION IN HUMANS MAY PROVIDE INSIGHT ABOUT OBESITY-RELATED HEALTH RISKS. JOURNAL OF LIPID RESEARCH, 60(10), 1710–1719. HTTPS://DOI.ORG/10.1194/JLR.R086975

2. SHEPHERD, J. A., NG, B. K., SOMMER, M. J., & HEYMSFIELD, S. B. (2017). BODY COMPOSITION BY DXA. BONE, 104, 101–105. HTTPS://DOI.ORG/10.1016/J.BONE.2017.06.010

3. ROMERO-CORRAL, A., SOMERS, V. K., SIERRA-JOHNSON, J., THOMAS, R. J., COLLAZO-CLAVELL, M. L., KORINEK, J., ALLISON, T. G., BATSIS, J. A., SERT-KUNIYOSHI, F. H., & LOPEZ-JIMENEZ, F. (2008). ACCURACY OF BODY MASS INDEX IN DIAGNOSING OBESITY IN THE ADULT GENERAL POPULATION. INTERNATIONAL JOURNAL OF OBESITY, 32(6), 959–966. HTTPS://DOI.ORG/10.1038/IJO.2008.11