

# Are Ultra-Processed Foods or Diet Quality Associated with Quality of Life Among Those with Celiac Disease or Other Americans?

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**Why:** To determine if there was an association between ultra-processed food (UPF) consumption or diet quality and quality of life (QOL) in adults and teens with Celiac Disease (CeD), and a representative sampling of Americans.

**Study Design, Setting and Participants:** A cross-sectional analysis of a study sample of 50 adults (84% F) and 30 teens (80% F) with CeD from the Celiac Disease Center at Columbia University Medical Center, New York, NY was compared with three 2-year cycles (2009-14) of NHANES, 15,853 adults (51% F) and 2,304 teens (52% F), including individuals with CeD.

**Results:** Those with the highest diet quality and lowest levels of UPF consumption had significantly higher QOL as compared to those with the lowest diet quality and highest levels of UPF consumption. This relationship was found in both the study sample with CeD and in NHANES, although more robustly in NHANES. All p's < 0.05.

**Conclusion:** Higher adherence to both a healthier diet and lower levels of ultra-processed food were generally associated with higher quality of life.

SNEB Educator Competencies: 1.3; 1.6; 2.1; 2.2; 8.1.

**Introduction:** The only known treatment for (CeD), a common autoimmune disease with ~1% prevalence, is the gluten free diet (GFD). Strict adherence to GFD is known to improve QOL among individuals with CeD. Gluten free products may or may not be UPF. Even though the GFD has been associated with poor nutritional quality, no research has examined the GFD in terms of diet quality or UPF and its association with QOL.

for adults; CDPQOL for teens) for the study sample and a general health-related QOL (HRQOL) survey for NHANES. Associations between diet quality and QOL were examined using ordinal logistic regression for the NHANES data, and ANCOVA for the study sample (p<0.05).

In NHANES, being in the highest versus lowest of 3 AMED categories, or lowest versus highest quintiles of UPF consumption, were ~2x more likely to have higher QOL, explaining ~8-10% of variance. Among the teen study sample with CeD, those in the highest versus lowest AMED tertile

were more likely to have higher QOL, but there was no association in adults. Additionally, for adults and teen sample, those in the lowest versus highest tertile of UPF were more likely to have higher QOL (only some components among teens). All p's<0.05.

**Measurable Outcome/Analysis:** Diet quality using Alternate Mediterranean Diet (AMED) and level of UPF (% energy) using the NOVA classification system, were assessed using multiple 24-h diet recalls. QOL was measured using a CeD-specific QOL survey (CDQOL

## Association of Diet Measures with QOL

	↑ AMED (highest vs lowest)	↓ UPF (% kcal) (lowest vs highest)
Reference group:	Lowest diet quality	Highest level of UPF
NHANES Adults	↑ QOL OR: 2.0 (1.6, 2.4)***	↑ QOL OR: 1.4 (1.2, 1.6)***
NHANES Teens	↑ QOL OR: 2.0 (1.1, 3.3)*	↑ QOL OR: 1.7 (1.2, 2.5) **
Study Sample Adults	None	↑ QOL QOL (overall): 67.6 → 79.9*†
Study Sample Teens	↑ QOL QOL (overall): 67.9 → 78.3*†	↑ QOL QOL (isolation): 66.3 → 73.8*†

Note. Presents either the odds ratios (NHANES) of higher QOL or the change in QOL scores (sample) for reference groups. Dark green arrows indicates a degree of significance between the diet measure and QOL. † indicates fewer components significant, or wide confidence intervals and less statistical significance. \*p < 0.05. \*\* p < 0.01. \*\*\* p < 0.001.

**Discussion:** Results are consistent with other research that has associated lower diet quality with lower QOL in the general population. There were demographic variables (not shown) that appeared to impact the associations between diet quality, level of UPF and QOL (e.g. age, gender, income). Lower UPF consumption was more consistently associated with QOL for the study sample. More research is needed to determine the potential mechanisms of these effects.