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Editorial

## Ultra-Processed Food Intake in U.S. Adolescents: National Public Health Implications



Beginning in youth, weight status and dietary intake are important predictors of lifelong health habits related to chronic disease [1,2]. While consuming foods rich in micronutrients enhances health and prevents chronic disease [3], intake of “ultra-processed” foods (UPFs) is related to increased cardiometabolic risk and cancer [4]. UPFs are defined as “multi-ingredient, industrially formulated mixtures containing little intact foods” (e.g., frozen meals, processed deli meats) [5]. The negative health influence of UPF consumption is documented in adults [4,6]; however, there is a paucity of data in youth. It is necessary to identify dietary risk factors for chronic disease in U.S. adolescents specifically, given trends for increased cardiometabolic risk factors and declining dietary quality in this population [1]. Health status and dietary habits of youth track into adulthood and carry health implications [2], emphasizing a need for research informing youth-specific public health intervention.

In this issue of the *Journal of Adolescent Health*, Zhang et al. [7] address these concerns by analyzing national data of adolescents aged 12–19 years to determine associations between consumption of UPF with the American Heart Association’s metrics of cardiovascular health (CVH). In this nationally representative sample including participants from the 2007–2018 National Health and Nutrition Examination Survey, two thirds of adolescents’ calories were consumed from UPF. Increased consumption of UPF was related to less desirable CVH, with those in the highest quartile of consuming UPF being more than twice as likely to demonstrate a poor CVH score compared with those in the lowest quartile. Furthermore, intake of UPF was particularly predictive of poor CVH among subgroups including older adolescents (aged 16–19 years), females, non-high school graduates, and those with low socioeconomic status. This is the first study to describe risk of a comprehensive measure of CVH, aligned with federal standards and prioritization, based on consumption of UPF and using primarily objective measures for the U.S. adolescent population.

The means through which UPF impacts health is multifaceted and complex. In this National Health and Nutrition Examination Survey study by Zhang et al. [7], greater proportions of calories from UPF were associated with adolescent overweight, obesity, and elevated blood pressure, suggesting a weight-driven causal

mechanism. In a randomized controlled trial where participants were fed either a UPF or non-UPF diet for 2 weeks, those on the UPF diet consumed more calories and gained weight, regardless of the non-UPF diet being similar in energy and macronutrient composition [8]. It can thus be inferred that, given the lack of fiber and high palatability of UPF [9], diets rich in UPF are less satiating and more likely to lead to overconsumption. In addition, UPFs are high in saturated fats, added sugar, and salt while being simultaneously low in micronutrients [9]. Hence, UPFs are replacing nutrient-rich foods that support satiety and proper nutrition and that ensure physical and cognitive growth and development of youth [10]. In this way, UPF composition aligns with the phenomenon known as the “nutrition paradox”, where consumption of energy-dense foods leads to risk of Westernized populations developing obesity while being simultaneously hungry, food insecure, and malnourished [11]. Aside from weight gain, concerns with the health impact of consuming UPF come from the presence of endocrine-disrupting chemicals from packaging materials (i.e., phthalates and bisphenol), which may negatively alter the microbiome and cause increased risk of metabolic dysfunction and cancer [12]. Similar health implications in youth are unknown.

Concerningly, the present study by Zhang et al. [7] reports that U.S. adolescents consume a greater proportion of calories from UPF than U.S. adults [6]. This suggests adolescents are an important, vulnerable subgroup who should be targeted for future intervention aiming to decrease national consumption of UPF. There are several reasons why adolescent diets may primarily comprise these foods compared with other age groups [13–15]. Adolescents have greater autonomy in selecting their foods at home and elsewhere than younger children, with fewer motivations and efficacy to prepare fresh foods independently than adults [13]. Adolescents with little personal spending money may be more likely to purchase inexpensive foods away from home, such as prepackaged or fast foods (e.g., UPF) [14]. Notably, during the academic year, U.S. youth consume nearly two thirds of daily weekday calories from school, where UPFs are often made available for purchase in cafeterias and vending machines [15]. Given the specificity in meal selection for adolescents, and this population’s relatively high consumption of UPF, health promotion efforts moving forward

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should tailor nutrition interventions to meet needs and preferences of U.S. youth, while promoting consumption of fresh, nonprocessed foods. Furthermore, to inform effective age-specific nutrition intervention, studies will be necessary to determine motivators and facilitators to healthy eating at home versus at school, and with peers, among adolescents.

Research using nationally representative data is crucial for determining the influence of health behavior on key health-related risk factors in the U.S. population and within adequately sampled sociodemographic subgroups. Use of national data is thus a primary strength of the present study by Zhang et al. [7], which provides strong external validity and adds to current UPF studies primarily conducted with smaller nonrepresentative international samples. Future research should continue to determine the impact of UPF consumption for youth in the U.S. and elsewhere, using a longitudinal cohort study design or by linking national data with long-term outcomes such as mortality. Given that U.S. adolescents consume a greater proportion of calories from UPF than U.S. adults [6], large-scale federal interventions may be necessary to enhance access and encouragement for youth to consume healthful, non-UPF food items. Example initiatives include required food standards for schools and retailers and subsidization for food and equipment necessary for retailers to offer fresh meals. This said, nationally representative data will continue to serve as an essential tool for monitoring trends in diet and related chronic disease outcomes over time as new initiatives are implemented and evaluated globally.

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## References

- [1] Ruiz LD, Zuelch ML, Dimitratos SM, Scherr RE. Adolescent obesity: Diet quality, psychosocial health, and cardiometabolic risk factors. *Nutrients* 2020; 12:43.
- [2] Christoph MJ, Larson NI, Winkler MR, et al. Longitudinal trajectories and prevalence of meeting dietary guidelines during the transition from adolescence to young adulthood. *Am J Clin Nutr* 2019;109: 656–64.
- [3] Ness AR, Powles JW. Fruit and vegetables, and cardiovascular disease: A review. *Int J Epidemiol* 1997;26:1–13.
- [4] Chen X, Zhang Z, Yang H, et al. Consumption of ultra-processed foods and health outcomes: A systematic review of epidemiological studies. *Nutr J* 2020;19:1–10.
- [5] Monteiro CA, Cannon G, Moubarac J-C, et al. The UN Decade of Nutrition, the NOVA food classification and the trouble with ultra-processing. *Public Health Nutr* 2018;21:5–17.
- [6] Zhang Z, Jackson SL, Martinez E, et al. Association between ultra-processed food intake and cardiovascular health in US adults: A cross-sectional analysis of the NHANES 2011–2016. *Am J Clin Nutr* 2021;113:428–36.
- [7] Zhang Z, Jackson SL, Steele EM, et al. Relationship between ultra-processed food intake and cardiovascular health among US adolescents: Results from the NHANES 2007–2018. *J Adolesc Health* 2022; 70:249–57.
- [8] Hall KD, Ayuketah A, Brychta R, et al. Ultra-processed diets cause excess calorie intake and weight gain: An inpatient randomized controlled trial of ad libitum food intake. *Cell Metab* 2019;30:67–77. e3.
- [9] Drewnowski A, Gupta S, Darmon N. An overlap between “ultra-processed” foods and the preexisting Nutrient Rich Foods Index? *Nutr Today* 2020;55: 75–81.
- [10] Monteiro CA, Cannon G, Lawrence M, et al. Ultra-processed foods, diet quality, and health using the NOVA classification system. Rome: FAO; 2019:48.
- [11] Caballero B. A nutrition paradox—underweight and obesity in developing countries. *N Engl J Med* 2005;352:1514–6.
- [12] McDonough CM, Xu HS, Guo TL. Toxicity of bisphenol analogues on the reproductive, nervous, and immune systems, and their relationships to gut microbiome and metabolism: Insights from a multi-species comparison. *Crit Rev Toxicol* 2021;51:283–300.
- [13] Bassett R, Chapman GE, Beagan BL. Autonomy and control: The co-construction of adolescent food choice. *Appetite* 2008;50:325–32.
- [14] He M, Tucker P, Gilliland J, et al. The influence of local food environments on adolescents’ food purchasing behaviors. *Int J Environ Res Public Health* 2012;9:1458–71.
- [15] van der Horst K, Timperio A, Crawford D, et al. The school food environment: Associations with adolescent soft drink and snack consumption. *Am J Prev Med* 2008;35:217–23.