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The Impact of Opuntia ficus-indica and Other Vegetables on Serum Cholesterol and Triglycerides: A Cross-Sectional Analysis

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Title: The Impact of Opuntia ficus-indica and Other Vegetables on Serum Cholesterol and Triglycerides: A Cross-Sectional Analysis

Background: Cholesterol is primarily synthesized in the liver. Treatment with statins and diet regulation are commonly prescribed for people with hypercholesterolemia. Previous claims suggest that the consumption of nopal and other vegetables may have a significant effect on diabetes but scarce is known about its relationship with cholesterol and triglycerides. The aim of this study was to evaluate the impact of nopal and other vegetables on serum cholesterol and triglyceride level in population not related with hypercholesterolemia.

Methods: We analyzed a dataset comprising of students from UMAN and their relatives totaling 198 participants. Participants completed an informed consent, filled out questionnaires, anthropometric and serum lipid measurements. A semi-quantitative food questionnaire assessed the frequency and amount of consumption for 56-specific foods. We did a factor analysis with varimax rotation using 7 specific foods we were interested. We conducted linear regression analyses with total cholesterol, LDL-c, and triglycerides as dependent variables. Age, sex, BMI, body fat percentage, and consumption factors (fruits, vegetables, and grains) were included as predictors. Collinearity was assessed using VIF calculations.

Results: Approximately 48% of participants consumed nopal on a weekly basis, with most considering their intake to be of "median" to "large" amounts, while only 11% reported never consuming nopal. Participants with diabetes showed higher nopal consumption [3.1 (s.e.m. 0.24) vs non-diabetic 2.7 (0.22) vs unknown 1.7 (0.28), p<0.04]. A slight correlation was observed between high self-efficacy in diet and nopal ingestion (rho 0.15, p=0.02), but no significant correlations were found for fruits or grains. Regression analysis revealed that LDL-c was associated with obesity (b=-20, p=0.04) and marginally with body fat percentage (adjusted b=0.83, p=0.069), but not with any of the consumption factors. Total cholesterol was explained by age (adjusted b=0.5, p=0.002) and body fat percentage (b=1.05, p=0.024). HDL-c was marginally associated with sex (Male b=-8.3, p=0.08), while triglycerides were associated with age and obesity (overweight and Class-I, b=0.04, p=0.001 and b=0.04, p=0.04, respectively). No collinearity was found in the analyzed regressions (VIF between 0.1 and 3.4).

Conclusion: Our findings suggest that cholesterol and other lipid traits are primarily influenced by genetic factors, with diet playing a minor role. Nopal, vegetables, and fruit showed no significant effects on serum lipid levels in our study. A limitation of our study is its cross-

sectional design, and future research could benefit from longitudinal studies with controlled amounts of nopal and other foods.