Alignment of Food Processing Classification Systems with Nutrient Quality (OR14-01-19)

Rachel Bleiweiss-Sande,† Kenneth Chui,‡ Whitney Evans,§ Sarah Amin,¶ Jeanne Goldberg,† and Jennifer Sacheck§

†Tufts Friedman School of Nutrition Science and Policy; ‡Department of Public Health and Community Medicine, School of Medicine, Tufts University; §The Miriam Hospital/Brown University Warren Alpert Medical School; ¶University of Rhode Island; and §George Washington University Milken Institute of Public Health

Objectives: Processed foods are associated with energy-dense eating patterns among children, yet research using food processing classification systems has led to varying conclusions regarding the impact of processed foods on dietary quality. This study utilized three common classification systems to examine (a) agreement between systems for processing level assignment, and (b) relationships between processing level, as determined by each classification system, and individual nutrient concentrations for foods commonly consumed by children.

Methods: The Nova, International Food Information Council (IFIC), and the University of North Carolina (UNC) systems were examined. Two researchers independently coded processing level according to each system’s criteria for the 100 most commonly consumed foods by children 6–12 yrs (NHANES 2013–2014). Inter-rater reliability was assessed using Spearman’s rank correlation. Concentration of under- (potassium, fiber, choline, magnesium, calcium, iron, vitamins A, D, E, and C) and over-consumed (added sugars, saturated fat and sodium) nutrients were quantified for 100 grams of each food. Alignment of processing classification systems with nutrient concentration was investigated using linear discriminant analysis and multinomial logistic regression, and compared among systems using Cohen’s kappa.

Results: Most foods were classified as highly processed (70%, 62% 53%, for the Nova, UNC and IFIC system, respectively). The UNC system had the highest inter-rater reliability ($r = 0.97, P < 0.001$), followed by IFIC ($r = 0.78, P < 0.001$) and Nova ($r = 0.76, P < 0.001$). Processing level was associated with greater sodium and total sugars for both UNC and IFIC, and iron for IFIC. Minimal processing was associated with a higher concentration of vitamin C for IFIC and UNC. There were no other significant associations. Agreement was highest between Nova and UNC ($k = 0.61, P < 0.001$) and lowest between Nova and IFIC ($k = 0.52, P < 0.001$).

Conclusions: Processing classification systems may differentiate highly processed foods by their nutrient qualities, but not moderately or minimally processed. Universal definitions for processing level assignment are needed to ensure consistent methodology in studies examining the relationship between processed food intake and health.

Funding Sources: NA.