Researchers find negative impact of junk food on kids' skeletal development

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Credit: Maliz Ong/public domain

A team of researchers from the Hebrew University of Jerusalem has proven the linkages between ultra-processed foods and reduced bone quality, unveiling the damage of these foods particularly for younger children in their developing years. The study, led by Professor Efrat Monsonego-Ornan and Dr. Janna Zaretsky from the Department of Biochemistry, Food Science and Nutrition at the University's Faculty of Agriculture, was published in the journal Bone Research and serves as the first comprehensive study of the effect of widely-available food products on skeleton development.

Ultra-processed foods—aka junk food—are food items products that undergo several stages of processing and contain non-dietary ingredients. They're popular with consumers because they are easily accessible, relatively inexpensive and ready to eat straight out of the package. The increasing prevalence of these products around the world has directly contributed to increased obesity and other mental and metabolic impacts on consumers of all ages.

Children tend to like junk food. As much as 70% percent of their caloric consumption are estimated to come from ultra-processed foods. While numerous studies have reflected on the overall negative impact of junk food, few have focused on its direct developmental effects on children, particularly young children.

The Hebrew University study provides the first comprehensive analysis for how these foods impact skeletal development. The study surveyed lab rodents whose skeletons were in the post embryonic stages of growth. The rodents that were subjected to ultra-processed foods suffered from growth retardation and their bone strength was adversely affected. Under histological examination, the researchers detected high levels of cartilage buildup in the rodents' growth plates, the "engine" of bone growth. When subjected to additional tests of the rodent cells, the researchers found that the RNA genetic profiles of cartilage cells that had been subjected to junk food were showing characteristics of impaired bone development.

The team then sought to analyze how specific eating habits might impact bone development and replicated this kind of food intake for the rodents. "We divided the rodents' weekly nutritional intake—30% came from a 'controlled' diet, 70% from ultra-processed foods," said Monsonego-Ornan. They found that the rodents experienced moderate damage to their bone density albeit there were fewer indications of cartilage buildup in their growth plates. "Our conclusion was that even in reduced amounts, the ultra-processed foods can have a definite negative impact on skeletal growth."

These findings are critical because children and adolescents consume these foods on a regular basis to the extent that 50 percent of American kids eat junk food each and every day. Monsonego-Ornan added. "When Carlos Monteiro, one of the world's leading experts on nutrition, said that there is no such thing as a healthy ultra-processed food, he was clearly right. Even if we reduce fats, carbs

nitrates and other known harmful substances, these foods still possess their damaging attributes. Every part of the body is prone to this damage and certainly those systems that remain in the critical stages of development."

More information: Janna Zaretsky et al. Ultra-processed food targets bone quality via endochondral ossification, *Bone Research* (2021). DOI: 10.1038/s41413-020-00127-9

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