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**Association between long-term consumption of soft drinks and variables of bone modeling and remodeling in a sample of healthy German children and adolescents.**

Libuda L, Alexy U, Remer T, Stehle P, Schoenau E, Kersting M.

**BACKGROUND:**

Soft drinks are thought to displace milk in diets of children and adolescents and therefore might affect variables of bone modeling and remodeling.

**OBJECTIVE:**

We assessed the association between long-term consumption of several types of soft drinks and bone variables in children and adolescents.

**DESIGN:**

Long-term dietary data from 3-d weighed dietary records collected by 228 healthy children and adolescents enrolled in the DONALD Study in 4 y of study participation were used for data analysis. Variables of bone modeling and remodeling of the radius were assessed by using peripheral quantitative computed tomography.

**RESULTS:**

After adjustment for age, sex, total energy intake, muscle area, BMI SD scores, and growth velocity, long-term consumption of all soft drinks and uncaffeinated soft drinks was negatively associated with bone mineral content ( $P < 0.05$ ), cortical area ( $P < 0.05$ ), and polar strength strain index ( $P < 0.05$ ), all of which reflect a combination of bone modeling and remodeling. Long-term consumption of caffeinated soft drinks was negatively associated with polar strength strain index ( $P < 0.01$ ) and periosteal circumference ( $P < 0.05$ ), which reflect bone modeling. Milk intake was positively associated with polar strength strain index ( $P < 0.05$ ). Consumption of all soft drinks was negatively associated with total protein and milk intake, but was not associated with potential renal acid load.

**CONCLUSIONS:**

Long-term consumption of caffeinated and uncaffeinated soft drinks appears to have bone catabolic effects in boys and girls. This effect is mainly mediated by the negative association with total protein intake and is not primarily based on milk displacement.