Zeitschriftenaufsatz
Apopian, Caroline M. (2004):
Sugar-sweetened soft drinks, obesity, and type 2 diabetes.
In: *JAMA* 292 (8), S. 978–979.

*Schlagwörter:*
Carbonated Beverages/adverse effects; Diabetes Mellitus, Type 2/epidemiology/prevention & control; Dietary Sucrose/adverse effects; Humans; Obesity/epidemiology/prevention & control; United States/epidemiology; Weight Gain

Zeitschriftenaufsatz
Babey, Susan H.; Jones, Malia; Yu, Hongjian; Goldstein, Harold (2009):
Bubbling over: soda consumption and its link to obesity in California.

*Abstract:*
Background The prevalence of overweight and obesity has increased dramatically in both adults and children in the last three decades in California. 62% of adolescents ages 12-17 and 41% of children ages 2-11 drink at least one soda or other sweetened beverage every day. In addition, 24% of adults drink at least one soda or other sweetened beverage on an average day. Adults who drink soda occasionally (not every day) are 15% more likely to be overweight or obese, and adults who drink one or more sodas per day are 27% more likely to be overweight or obese than adults who do not drink soda, even when adjusting for poverty status and race/ethnicity. This policy brief, produced collaboratively by the California Center for Public Health Advocacy and the UCLA Center for Health Policy Research, examines soda consumption in California by cities and counties using data from the 2005 California Health Interview Survey (CHIS 2005). In addition, the brief investigates whether there is an association between soda consumption and the prevalence of overweight and obesity. There are major differences in soda consumption rates by geographic area in California, suggesting that social and environmental factors affect the consumption of soda. Also, the prevalence of overweight and obesity is higher among those who drink one or more sodas or other sweetened beverages every day than among those who do not consume these soft drinks. Establishing public policies that focus on reducing soda consumption could contribute to reversing California’s increasing overweight and obesity problem.

*Schlagwörter:*
Adolescent; Adult; Beverages/adverse effects; Body Mass Index; California/epidemiology; Carbonated Beverages/adverse effects; Child; Child, Preschool; Data Collection; Dietary Carbohydrates/adverse effects; Drinking Behavior; Humans; Obesity/etiology; Overweight/etiology

Zeitschriftenaufsatz
Die bedeutung des Verzehrs von Mono- und Disacchariden in Getränken für die Entwicklung von Übergewicht und die Gesundheit.

*Abstract:*
Unter den bisher identifizierten Determinanten für den weltweiten Prävalenzanstieg von Übergewicht und Adipositas werden zunehmend auch einfache Kohlenhydrate, insbesondere Fruktose - sei es in gebundener Form als Saccharose oder in High Corn Fructose Syrup (HFCS) - diskutiert. Für einen solchen Zusammenhang spricht laut US-amerikanischen Autoren besonders der dort zu beobachtende parallele Anstieg von Adipositaspävalenz mit dem steigenden Verzehr HFCS-gesüßter Getränke. Gestützt wird dies durch die wiederholte Beobachtung in mehrwöchigen kontrollierten Ernährungsbeobachtungen an Versuchspersonen, bei denen HFCS bzw. Saccharose bei Verzehr in flüssiger...

Zeitschriftenaufsatz

Bawa, Sa’eed (2005):

The role of the consumption of beverages in the obesity epidemic.


Abstract:
This paper is intended to demonstrate to nutritionists, dietitians, paediatricians and other health care professionals as well as parents, primary and secondary school authorities, nutritional concerns pertaining to the consumption of soft drinks. High intake of soft drinks is associated with: 1) overweight or obesity because of the intake of additional calories in the diet; 2) increased risk of osteoporosis due to displacement of milk consumption, resulting in calcium deficiency and subsequent bone resorption; and 3) increased risk of dental caries and potential enamel erosion. School officials and parents should be aware of the health implications of vended drinks in schools before making a decision about pupils’ and students’ access to them.

Schlagwörter:
Beverages/adverse effects; Disease Outbreaks/statistics & numerical data; Drinking Behavior; Fructose/adverse effects; Great Britain/epidemiology; Humans; Nutritional Support/standards; Obesity/epidemiology/etiology; Patient Education as Topic/methods/standards; Prevalence; Risk Factors

Zeitschriftenaufsatz

Blum, Janet Whatley; Jacobsen, Dennis J.; Donnelly, Joseph E. (2005):

Beverage consumption patterns in elementary school aged children across a two-year period.

In: J Am Coll Nutr 24 (2), S. 93–98.

Abstract:
OBJECTIVE
Existing data was reexamined to determine changes in beverage consumption and associations between beverages consumed and BMI Z-score in children (n = 164) across two years.

METHODS
Beverages (milk, 100% juice, diet soda or sugar sweetened) and total caloric intake were calculated from a 24-hour diet recall. Height and weight were measured to calculate BMI. Subjects were categorized by BMI Z-score as normal weight, overweight, gained weight and lost weight. Data was collected at baseline and year 2.

RESULTS
Significant decreases in milk and increases in diet soda were found over two years in all subjects and normal weight, whereas overweight had a significant increase in diet soda consumption and a decrease in milk consumption that did not reach significance. Change in milk consumption was inversely correlated with sugar-sweetened beverage consumption. Increases in diet soda consumption were significantly greater for overweight and subjects who gained weight as compared to normal weight subjects. Baseline BMI Z-score and year 2 diet soda consumption predicted 83.1% of the variance in year 2 BMI Z-score.

CONCLUSION
Shifts in beverage consumption were found in this convenient sample across two years. Diet soda consumption was the only type of beverage associated with year 2 BMI Z-score, and consumption was greater in overweight subjects
and subjects who gained weight as compared to normal weight subjects at two years. Additional longitudinal data examining associations between beverage consumption and BMI is needed in children and adolescents, as consumption of regular and diet soda has become more of a social norm.

Schlagwörter:
Animals; Beverages/statistics & numerical data; Body Mass Index; Carbonated Beverages/statistics & numerical data; Child; Cohort Studies; Diet Surveys; Energy Intake/physiology; Female; Food Habits; Food Preferences; Humans; Longitudinal Studies; Male; Mental Recall; Milk/statistics & numerical data; Weight Gain/physiology

Zeitschriftenaufsatz
Brown, C. M.; Dulloo, A. G.; Montani, J-P (2008):
Sugary drinks in the pathogenesis of obesity and cardiovascular diseases.
In: Int J Obes (Lond) 32 Suppl 6, S. S28-34.

Abstract:
Soft drink overconsumption is now considered to be a major public health concern with implications for cardiovascular diseases. This follows a number of studies performed in animals suggesting that chronic consumption of refined sugars can contribute to metabolic and cardiovascular dysregulation. In particular, the monosaccharide fructose has been attracting increasing attention as the more harmful sugar component in terms of weight gain and metabolic disturbances. High-fructose corn syrup is gradually replacing sucrose as the main sweetener in soft drinks and has been blamed as a potential contributor to the current high prevalence of obesity. There is also considerable evidence that fructose, rather than glucose, is the more damaging sugar component in terms of cardiovascular risk. This review focuses on the potential role of sugar drinks, particularly the fructose component, in the pathogenesis of obesity and cardiovascular diseases.

Schlagwörter:
Adiposity; Animals; Beverages/adverse effects; Caffeine/metabolism; Cardiovascular Diseases/etiology; Dietary Sucrose/adverse effects/metabolism; Dogs; Fructose/adverse effects/metabolism; Humans; Insulin Resistance; Obesity/etiology; Rats; Sweetening Agents/adverse effects/metabolism; Uric Acid/metabolism

Zeitschriftenaufsatz
Brown, Denise M.; Tammineni, Suresh K. (2009):
Managing sales of beverages in schools to preserve profits and improve children's nutrition intake in 15 Mississippi schools.

Abstract:
School environments that provide consistent and reliable nutrition information promote the development of healthful eating in children. High-energy, nutrient-poor beverages offered for sale to children during the school day compete with healthful choices. The primary objective of this prospective, quasiexperimental study was to encourage children to choose more healthful beverages during the school day without adversely affecting the profits realized from vending sales. Fifteen of 18 schools completed voluntary changes to beverage sales practices during the school day between August 2005 and May 2006. Twelve of 15 schools reported increased profits from the previous year (2004-2005) while offering more healthful beverage choices at discounted prices. Units of carbonated soft drinks sold declined when sports drinks, 100% fruit juice, and water were made available in their place. Passive marketing in the form of vending machine fronts, attractive pricing with a nominal 10% to 25% discount, and changing the types and proportions of beverages offered encouraged children to make more healthful choices. Local school administrators were receptive to making changes to beverage sales when local needs were incorporated into the study design. Profit information from this study informed state legislators and the Mississippi State Board of Education in the development and adoption of statewide snack and beverage vending guidelines. Registered dietitians serve as advocates to foster these collaborative efforts, inform key decision makers, and work in their local communities to develop and promote healthful practices in K-12 school settings.
Schlagwörter:
Adolescent; Adolescent Behavior; Beverages/economics/standards/statistics & numerical data; Carbonated Beverages/adverse effects/economics/statistics & numerical data; Child; Child Behavior; Child Nutritional Physiological Phenomena/physiology; Choice Behavior; Cross-Sectional Studies; Female; Food Dispensers, Automatic/economics/statistics & numerical data/utilization; Health Behavior; Health Promotion/methods; Humans; Male; Mississippi; Nutritive Value; Overweight/prevention & control; Prospective Studies; Schools/economics/statistics & numerical data

Zeitschriftenaufsatz
Collison, Kate S.; Zaidi, Marya Z.; Subhani, Shazia N.; Al-Rubeaan, Khalid; Shoukri, Mohammed; Al-Mohanna, Futwan A. (2010):
Sugar-sweetened carbonated beverage consumption correlates with BMI, waist circumference, and poor dietary choices in school children.
In: BMC Public Health 10, S. 234.

Abstract:
BACKGROUND
The prevalence of obesity and overweight is increasing globally. Frequently coexisting with under-nutrition in developing countries, obesity is a major contributor to chronic disease, and will become a serious healthcare burden especially in countries with a larger percentage of youthful population. 35% of the population of Saudi Arabia are under the age of 16, and adult dietary preferences are often established during early childhood years. Our objective was to examine the dietary habits in relation to body-mass-index (BMI) and waist circumference (W_C), together with exercise and sleep patterns in a cohort of male and female Saudi school children, in order to ascertain whether dietary patterns are associated with obesity phenotypes in this population.

METHODS
5033 boys and 4400 girls aged 10 to 19 years old participated in a designed Food Frequency Questionnaire. BMI and W_C measurements were obtained and correlated with dietary intake.

RESULTS
The overall prevalence of overweight and obesity was 12.2% and 27.0% respectively, with boys having higher obesity rates than girls (P ≤ 0.001). W_C and BMI was positively correlated with sugar-sweetened carbonated beverage (SSCB) intake in boys only. The association between male BMI and SSCB consumption was significant in a multivariate regression model (P < 0.0001). SSCB intake was positively associated with poor dietary choices in both males and females. Fast food meal intake, savory snacks, iced desserts and total sugar consumption correlated with SSCB intake in both boys (r = 0.39, 0.13, 0.10 and 0.52 respectively, P < 0.001) and girls (r = 0.45, 0.23, 0.16 and 0.55 respectively, P < 0.001). Older children reported eating significantly less fruit and vegetables than younger children; and less eggs, fish and cereals. Conversely, consumption of SSCB and sugar-sweetened hot beverages were higher in older versus younger children (P < 0.001). BMI and W_C were negatively correlated with hours of night-time sleep and exercise in boys, but only with night time sleep in girls, who also showed the lowest frequency of exercise.

CONCLUSIONS
A higher intake of SSCB is associated with poor dietary choices. Male SSCB intake correlates with a higher W_C and BMI. Limiting exposure to SSCB could therefore have a large public health impact.

Schlagwörter:
Adolescent; Body Mass Index; Carbonated Beverages/adverse effects/utilization; Child; Diet; Dietary Sucrose/adverse effects; Exercise; Female; Food Habits; Humans; Male; Obesity/etiology; Overweight/etiology; Questionnaires; Saudi Arabia; Waist Circumference; Young Adult

Zeitschriftenaufsatz
Beverage consumption and adult weight management: A review.
In: Eat Behav 10 (4), S. 237–246.
Abstract:
Total energy consumption among United States adults has increased in recent decades, and energy-containing beverages are a significant contributor to this increase. Because beverages are less satiating than solid foods, consumption of energy-containing beverages may increase energy intake and lead to weight gain; trends in food and beverage consumption coinciding with increases in overweight and obesity support this possibility. The purpose of this review is to present what is known about the effect of beverage consumption on short-term (i.e., meal) energy intake, as well as longer-term effects on body weight. Specific beverages addressed include water, other energy-free beverages (diet soft drinks, coffee and tea), and energy-containing beverages (soft drinks, juices and juice drinks, milk and soy beverages, alcohol). Existing evidence, albeit limited, suggests that encouraging water consumption, and substituting water and other energy-free beverages (diet soft drinks, coffee and tea) for energy-containing beverages may facilitate weight management. Energy-containing beverages acutely increase energy intake, however long-term effects on body weight are uncertain. While there may be health benefits for some beverage categories, additional energy provided by beverages should be compensated for by reduced consumption of other foods in the diet.

Schlagwörter:
Adult; Beverages; Body Weight/physiology; Drinking/physiology; Energy Intake/physiology; Humans; Weight Gain/physiology; Weight Loss/physiology

Zeitschriftenaufsatz
Association between sweetened beverage consumption and body mass index, proportion of body fat and body fat distribution in Mexican adolescents.

Abstract:
BACKGROUND/AIMS
It was the aim of this study to evaluate the relationships between sweetened beverage (SB) consumption and the following indicators of overweight/fatness among Mexican adolescents: body mass index, body composition and body fat distribution.

METHODS
We performed a cross-sectional analysis of data from adolescents participating in the baseline assessment of the Health Workers Cohort Study. Information on sociodemographic conditions, sexual maturation, dietary patterns and physical activity was collected via self-administered questionnaires. SB consumption was evaluated through a validated semiquantitative food frequency questionnaire. Anthropometric measures were assessed with standardized procedures. The associations of interest were evaluated by means of multivariate regression and logistic regression models.

RESULTS
A total of 1,055 adolescents, 10-19 years old (mean age 14.5+/−2.5 years), were evaluated. The overweight/obesity prevalence was 31.6% among girls and 31.9% among boys. We found that for each additional SB serving consumed daily, the subject’s body mass index increased by on average 0.33 (p<0.001). Subjects consuming 3 daily servings of SB face a 2.1 times greater risk of proportionally excess body fat than those who consume less than 1 SB a day.

CONCLUSIONS
Our data support the hypothesis that the consumption of SB increases the risk of overweight and/or obesity and encourages excess body fat and central obesity in Mexican adolescents.

Schlagwörter:
Adipose Tissue/metabolism; Adolescent; Analysis of Variance; Beverages; Body Composition/physiology; Body Mass Index; Child; Cohort Studies; Cross-Sectional Studies; Dietary Sucrose/administration & dosage/adverse effects; Dose-Response Relationship, Drug; Female; Humans; Logistic Models; Male; Mexico/epidemiology; Obesity/epidemiology/etiology; Overweight/epidemiology/etiology; Questionnaires; Risk Factors; Young Adult
Zeitschriftenaufsatz

Drewnowski, Adam; Bellisle, France (2007):

Liquid calories, sugar, and body weight.


Abstract:
The consumption of sugar-sweetened beverages has been linked to rising rates of obesity in the United States. The standard explanation is that energy-containing liquids are less satiating than are solid foods. However, purely physiologic mechanisms do not fully account for the proposed links between liquid sugar energy and body weight change. First, a reevaluation of published epidemiologic studies of consumption of sweetened beverages and overweight shows that most such studies either are cross-sectional or are based on passive surveillance of temporal trends and thus permit no conclusions about causal links. Second, research evidence comparing the short-term satiating power of different types of liquids and of solids remains inconclusive. Numerous clinical studies have shown that sugar-containing liquids, when consumed in place of usual meals, can lead to a significant and sustained weight loss. The principal ingredient of liquid meal replacement shakes is sugar, often high-fructose corn syrup, which is present in amounts comparable to those in soft drinks. Far from suppressing satiety, one such liquid shake is marketed on the grounds that it helps control hunger and prevents hunger longer when consumed for the purpose of weight loss. These inconsistencies raise the question whether the issue of sugars and body weight should continue to be framed purely in metabolic or physiologic terms. The effect of sugar consumption on body weight can also depend on behavioral intent, context, and the mode of use, availability, and cost of sweetened liquids.

Schlagwörter:
Beverages; Body Weight; Diet, Reducing; Dietary Sucrose; Humans; Satiation; Weight Gain

Zeitschriftenaufsatz

Dubois, Lise; Farmer, Anna; Girard, Manon; Peterson, Kelly (2007):

Regular sugar-sweetened beverage consumption between meals increases risk of overweight among preschool-aged children.

In: *J Am Diet Assoc* 107 (6), S. 924-34; discussion 934-5.

Abstract:
OBJECTIVE
To examine the relationship between consumption of sugar-sweetened beverages (eg, nondiet carbonated drinks and fruit drinks) and the prevalence of overweight among preschool-aged children living in Canada.

DESIGN
Data come from the Longitudinal Study of Child Development in Québec (1998-2002).

SUBJECTS/SETTING
A representative sample (n=2,103) of children born in 1998 in Québec, Canada. A total of 1,944 children (still representative of the same-age children in this population) remaining at 4 to 5 years in 2002 participated in the nutrition study.

STATISTICAL ANALYSES PERFORMED
Data were collected via 24-hour dietary recall interview. Frequency of sugar-sweetened beverage consumption between meals at age 2.5, 3.5, and 4.5 years was recorded and children’s height and weight were measured. Multivariate regression analysis was done with Statistical Analysis System software. Weighted data were adjusted for within-child variability and significance level was set at 5%.

RESULTS
Overall, 6.9% of children who were nonconsumers of sugar-sweetened beverages between meals between the ages of 2.5 to 4.5 years were overweight at 4.5 years, compared to 15.4% of regular consumers (four to six times or more per week) at ages 2.5 years, 3.5 years, and 4.5 years. According to multivariate analysis, sugar-sweetened beverage consumption between meals more than doubles the odds of being overweight when other important factors are considered in multivariate analysis. Children from families with insufficient income who consume sugar-sweetened beverages regularly between the ages of 2.5 and 4.5 years are more than three times more likely to be overweight at age 4.5 years compared to nonconsuming children from sufficient income households.
CONCLUSIONS
Regular sugar-sweetened beverage consumption between meals may put some young children at a greater risk for overweight. Parents should limit the quantity of sweetened beverages consumed during preschool years because it may increase propensity to gain weight.

Schlagwörter:
Beverages; Body Height; Body Weight; Child Nutritional Physiological Phenomena; Child, Preschool; Dietary Sucrose/administration & dosage/adverse effects; Energy Intake/physiology; Female; Humans; Longitudinal Studies; Male; Mental Recall; Multivariate Analysis; Nutrition Surveys; Obesity/epidemiology/etiology/prevention & control; Overweight; Prevalence; Quebec/epidemiology

Zeitschriftenaufsatz
Fletcher, Jason M.; Frisvold, David; Tefft, Nathan (2010):
Can Soft Drink Taxes Reduce Population Weight?
In: Contemp Econ Policy 28 (1), S. 23–35.
Abstract:
Soft drink consumption has been hypothesized as one of the major factors in the growing rates of obesity in the US. Nearly two-thirds of all states currently tax soft drinks using excise taxes, sales taxes, or special exemptions to food exemptions from sales taxes to reduce consumption of this product, raise revenue, and improve public health. In this paper, we evaluate the impact of changes in state soft drink taxes on body mass index (BMI), obesity, and overweight. Our results suggest that soft drink taxes influence BMI, but that the impact is small in magnitude.

Zeitschriftenaufsatz
The role of beverage consumption, physical activity, sedentary behavior, and demographics on body mass index of adolescents.
Abstract:
The percentage of US adolescents who are overweight or at-risk of overweight has increased over the past 20 years. Using data from the third National Health and Nutrition Examination Survey 1988-1994, multivariate regression models of body mass index (BMI) for adolescent males and females aged 12-16 years were developed to examine the relative importance of demographics, beverage consumption, physical activity, and sedentary behavior for maintaining a healthy body weight. The models explained between 11% and 19% of the variance in BMI. Demographic characteristics accounted for roughly one-half of the explained variance in the models. Age was positively associated with BMI for males and females. Family income had a negative association with BMI for females, but no association with BMI for males. The variables for race/ethnicity and region were only occasionally statistically significant. A strong negative association was found between BMI and participation in team sports or exercise programs for both males and females. The estimate of the relationship between television viewing and BMI was positive but not statistically significant. Consumption of regular carbonated soft drinks (RCSD) and fruit drinks/ades--two beverages widely hypothesized to be positively associated with BMI--were not statistically significant in any of the models. Consumption of diet carbonated soft drinks was very low and was positively associated with BMI for females but not for males. The potential impacts of increasing participation in teams or exercise programs, reducing television viewing, and reducing RCSD consumption on BMI were examined. Increasing participation in teams or exercise programs consistently had the largest impact on reducing predicted BMI. The impact of reducing television viewing had the next largest impact. Reducing consumption of RCSD had the smallest impact. Policies that revitalize physical activity and physical education programs for all students--not just student athletes--and educational efforts that discourage sedentary behavior will be far more successful in combating overweight than an undue focus on beverage consumption.
Sugar-sweetened beverages and body mass index in children and adolescents: a meta-analysis.

Abstract:
BACKGROUND
Rates of overweight and obesity have increased. Consumption of sugar-sweetened beverages (SBs) may play a role.
OBJECTIVE
The purpose of this meta-analysis was to determine whether the results of original research with the use of longitudinal and randomized controlled trials (RCTs) support the hypothesis that SB consumption is associated with weight gain among children and adolescents.
DESIGN
The MEDLINE database was used to retrieve all original studies of SBs and weight gain involving children and adolescents. Twelve (10 longitudinal and 2 RCT) studies were reviewed. Eight of the longitudinal studies and both RCT studies were incorporated into a quantitative meta-analysis. Forest plots and overall estimates and CIs for the association of the difference (Delta) in SB consumption with Deltabody mass index (BMI; in kg/m(2)) were produced. Funnel plots were examined as a diagnostic test for publication bias. Databases of unpublished scientific studies were searched. Sensitivity tests were conducted to examine the robustness of the meta-analysis results.
RESULTS
The overall estimate of the association was a 0.004 (95% CI: 0.006, 0.014) change in BMI during the time period defined by the study for each serving per day change in SB consumption with the fixed-effects model and 0.017 (95% CI: 0.009, 0.044) with the random-effects model. The funnel plot is consistent with publication bias against studies that do not report statistically significant findings. The sensitivity tests suggest that the results are robust to alternative assumptions and new studies.
CONCLUSION
The quantitative meta-analysis and qualitative review found that the association between SB consumption and BMI was near zero, based on the current body of scientific evidence.

Schlagwörter:
Beverages; Body Mass Index; Child, Preschool; Dietary Carbohydrates; Humans; Longitudinal Studies; Male; Obesity/prevention & control; Overweight/prevention & control; Sucrose
consumption with rising BMI rates is unreliable. Evidence from epidemiologic studies and randomized controlled trials is inconclusive. Studies analyzing the differences between HFCS and sucrose consumption and their contributions to weight gain do not exist. HFCS and sucrose have similar monosaccharide compositions and sweetness values. The fructose:glucose (F:G) ratio in the U.S. food supply has not appreciably changed since the introduction of HFCS in the 1960s. It is unclear why HFCS would affect satiety or absorption and metabolism of fructose any differently than would sucrose. Based on the currently available evidence, the expert panel concluded that HFCS does not appear to contribute to overweight and obesity any differently than do other energy sources. Research recommendations were made to improve our understanding of the association of HFCS and weight gain.

Schlagwörter: Beverages/adverse effects; Body Mass Index; Dietary Sucrose/administration & dosage/adverse effects; Evidence-Based Medicine; Fructose/administration & dosage/adverse effects; Humans; Longitudinal Studies; Obesity/chemically induced/epidemiology; Randomized Controlled Trials as Topic; Sweetening Agents/administration & dosage/adverse effects; United States/epidemiology; Weight Gain/drug effects

Zeitschriftenaufsatz
Gibson, Sigrid (2008):
Sugar-sweetened soft drinks and obesity: a systematic review of the evidence from observational studies and interventions.

Abstract:
Sugar-sweetened soft drinks (SSD) are a special target of many obesity-prevention strategies, yet critical reviews tend to be more cautious regarding the aetiological role of SSD in promoting excess body weight. Since ongoing evaluation of this issue is important, the present systematic review re-examined the evidence from epidemiological studies and interventions, up to July 2008. Database searches of Medline, Cochrane reviews, Google scholar and a hand search of cross-references identified forty-four original studies (twenty-three cross-sectional, seventeen prospective and four intervention) in adults and children, as well as six reviews. These were critically examined for methodology, results and interpretation. Approximately half the cross-sectional and prospective studies found a statistically significant association between SSD consumption and BMI, weight, adiposity or weight gain in at least one subgroup. The totality of evidence is dominated by American studies where SSD consumption tends to be higher and formulations different. Most studies suggest that the effect of SSD is small except in susceptible individuals or at high levels of intake. Methodological weaknesses mean that many studies cannot detect whether soft drinks or other aspects of diet and lifestyle have contributed to excess body weight. Progress in reaching a definitive conclusion on the role of SSD in obesity is hampered by the paucity of good-quality interventions which reliably monitor diet and lifestyle and adequately report effect sizes. Of the three long-term (>6 months) interventions, one reported a decrease in obesity prevalence but no change in mean BMI and two found a significant impact only among children already overweight at baseline. Of the six reviews, two concluded that the evidence was strong, one that an association was probable, while three described it as inconclusive, equivocal or near zero. Reasons for some discrepancies are presented.

Schlagwörter:
Adult; Beverages/adverse effects; Body Mass Index; Carbonated Beverages/adverse effects; Child; Cross-Sectional Studies; Diet/adverse effects; Dietary Sucrose/adverse effects; Humans; Longitudinal Studies; Overweight/epidemiology/etiology

Zeitschriftenaufsatz
Gibson, Sigrid; Neate, Deborah (2007):
In: Int J Food Sci Nutr 58 (6), S. 445–460.
Abstract:
We investigated associations between body mass index (BMI) and intake of non-milk extrinsic sugars (NMES) and caloric soft drinks using weighed 7-day food records, nutrient intakes, BMI measurements and 7-day physical activity (PA) diaries from the UK National Dietary and Nutritional Survey of Young People (n=1,294 aged 7-18 years). NMES and caloric soft drinks (excluding 100% fruit juice) were quantified by their contribution to energy intake. BMI z-scores were calculated from UK reference curves and International Obesity Task Force (IOTF) cut-off values were used to define overweight. The BMI z-score was weakly inversely correlated with percentage energy from NMES after adjustment for under-reporting and dieting (r=-0.06, P=0.03). The percentage of energy from soft drinks was not associated with the BMI z-score or PA. After excluding under-reporters and dieters, the heaviest children (top quintile: Q5 of BMI z-scores) consumed more total energy (+1,220 kJ/day) than those in the lowest quintile (Q1), but only 60 kJ (5%) was from soft drinks. In logistic regression (adjusted for age and gender, under-reporting, and dieting), overweight was positively associated with energy intake (MJ) (odds ratio [OR]=1.58, confidence interval [CI]=1.42-1.77) and sedentary activity (h) (OR=1.11, CI=1.01-1.23), and inversely associated with moderate/vigorous activity (h) (OR=0.71, CI=0.58-0.86). In the macronutrient model, high fat and protein intake (top tertile vs lowest tertile, g/day) were positively associated with overweight (OR>2.5, P<0.001) while starch had less impact (OR=1.60, CI=1.0-2.55, P<0.05). Top tertile intakes of caloric soft drinks were weakly associated with overweight (OR=1.39, CI=0.96-2.0, P=0.08), while other sources of NMES showed no association (OR=0.81, CI=0.52-1.27, P=0.4). Risk associated with caloric soft drinks appeared non-linear with an increase in odds only for very high consumers (top quintile, mean 870 kJ/day; OR=1.67, CI=1.04-2.66, P=0.03). These data are not consistent with any specific role for NMES or caloric soft drinks in obesity among British children and adolescents, but point instead to a general role of overeating and physical inactivity. Evidence of successful interventions is urgently needed but these must use reliable measurements of exposure (diet and PA) and outcome (BMI z-score, body fat, waist circumference) and have a sufficient timescale.

Schlagwörter:
Adolescent; Beverages/adverse effects/statistics & numerical data; Body Mass Index; Body Weight; Child; Child Nutritional Physiological Phenomena; Dietary Sucrose/adverse effects; Exercise/physiology; Female; Great Britain/epidemiology; Humans; Male; Multivariate Analysis; Nutrition Surveys; Obesity/etiology/psychology

Zeitschriftenaufsatz
Harrington, Susan (2008):

The role of sugar-sweetened beverage consumption in adolescent obesity: a review of the literature.

In: J Sch Nurs 24 (1), S. 3–12.

Abstract:
Soft drink consumption has increased by 300% in the past 20 years, and 56-85% of children in school consume at least one soft drink daily. The odds ratio of becoming obese among children increases 1.6 times for each additional can or glass of sugar-sweetened drink consumed beyond their usual daily intake of the beverage. Soft drinks currently constitute the leading source of added sugars in the diet and exceed the U.S. Department of Agriculture’s recommended total sugar consumption for adolescents. With the increase in adolescent obesity and the concurrent increase in consumption of sugar-sweetened beverages (SSB), the assumption infers a relationship between the two variables. SSB, classified as high-glycemic index (GI) liquids, increase postprandial blood glucose levels and decrease insulin sensitivity. Additionally, high-GI drinks submit to a decreased satiety level and subsequent overeating. Low-GI beverages stimulate a delayed return of hunger, thereby prompting an increased flexibility in amounts and frequencies of servings. Single intervention manipulation, elimination, or marked reduction of SSB consumption may serve to decrease caloric intake, increase satiety levels, decrease tendencies towards insulin resistance, and simplify the process of weight management in this population.

Schlagwörter:
Adolescent; Adolescent Behavior/psychology; Adolescent Nutritional Physiological Phenomena; Adolescent Psychology; Blood Glucose/physiology; Carbonated Beverages/adverse effects; Dietary Sucrose/adverse effects; Energy Intake; Feasibility Studies; Food Dispensers, Automatic; Food Habits/physiology/psychology; Food Preferences; Glycemic Index; Humans; Insulin Resistance/physiology; Nurse’s Role; Nutrition Policy; Nutrition Surveys; Obesity/epidemiology/etiology/prevention & control; Risk Factors; Satiety Response; School Nursing/organization & administration; United States/epidemiology
Determinants and patterns of soft drink consumption in young adults: a qualitative analysis.


Abstract:
OBJECTIVE
To explore knowledge, attitudes and behaviours regarding caloric soft drinks in a group of young adults attending university and to identify opportunities for a health promotion intervention aimed at reducing consumption.

DESIGN
In-depth, semi-structured focus groups segmented by gender.

SETTING
Sydney, Australia.

SUBJECTS
Undergraduate University of Sydney students aged 18–30 years (n 35).

RESULTS
Social and environmental cues, intrinsic qualities of beverages and personal health beliefs were identified as important influences on consumption. Social cues included settings in which alcohol is usually consumed, socialising with friends, and family influences. Environmental cues included purchasing of fast foods, and ready availability, preferential pricing and promotion of caloric beverages. Reinforcing intrinsic qualities of caloric soft drinks included taste, sugar and caffeine content, and their association with treats and rewards. Major gender differences as well as variations in individual readiness for behaviour change were observed. Raising awareness of the sugar content of various beverages and the potential health impacts associated with their consumption was considered important.

CONCLUSIONS
The findings provide new insights with important implications for policy and practice, and suggest that there is considerable scope for promoting awareness in this group. Carefully designed social marketing campaigns highlighting the health issues and addressing social and environmental cues relating to caloric soft drink consumption are required. There is a need for gender-differentiated intervention programmes which are both informational and appealing to young adults. Further research is warranted, particularly to investigate beverage consumption relating to fast-food meal deals and young adults’ consumption patterns in more depth.

Schlagwörter:
Adolescent; Adult; Beverages/adverse effects/standards/utilization; Dietary Sucrose/administration & dosage/adverse effects; Female; Focus Groups; Food Supply; Health Behavior; Health Knowledge, Attitudes, Practice; Humans; Male; Sex Factors; Social Environment; Students; Young Adult

The worldwide battle against soft drinks in schools.


Abstract:
Sugar-sweetened beverages are widely believed to be contributing to the growing prevalence of overweight and obesity around the world. One of the channels used by industry to encourage greater consumption and preferences for soft drinks is schools. But governments around the world are taking action to limit the availability of soft drinks in schools. More than 30 national and subnational governmental bodies have made efforts to restrict availability, and the soft drinks industry has also taken some limited voluntary action. Most government-led efforts-with some exceptions-restrict the availability of any drink with added sugar, but the voluntary pledges take less-restrictive approaches. There is little consensus on artificially sweetened drinks. Policies vary in other ways, too, presenting an opportunity to study the effects of different policy approaches on short- and long-term consumption and attitudes. In the meantime, the widespread condemnation of soft drinks in schools suggests that it is within the industry's interests to take more comprehensive action.
Hu, Frank B.; Malik, Vasanti S. (2010):
Sugar-sweetened beverages and risk of obesity and type 2 diabetes: epidemiologic evidence.

Abstract:
In recent decades, temporal patterns in SSB intake have shown a close parallel between the upsurge in obesity and rising levels of SSB consumption. SSBs are beverages that contain added caloric sweeteners such as sucrose, high-fructose corn syrup or fruit-juice concentrates, all of which result in similar metabolic effects. They include the full spectrum of soft drinks, carbonated soft drinks, fruitades, fruit drinks, sports drinks, energy and vitamin water drinks, sweetened iced tea, cordial, squashes, and lemonade, which collectively are the largest contributor to added sugar intake in the US. It has long been suspected that SSBs have an etiologic role in the obesity epidemic, however only recently have large epidemiological studies been able to quantify the relationship between SSB consumption and long-term weight gain, type 2 diabetes (T2DM) and cardiovascular disease (CVD) risk. Experimental studies have provided important insight into potential underlying biological mechanisms. It is thought that SSBs contribute to weight gain in part by incomplete compensation for energy at subsequent meals following intake of liquid calories. They may also increase risk of T2DM and CVD as a contributor to a high dietary glycemic load leading to inflammation, insulin resistance and impaired beta-cell function. Additional metabolic effects from the fructose fraction of these beverages may also promote accumulation of visceral adiposity, and increased hepatic de novo lipogenesis, and hypertension due to hyperuricemia. Consumption of SSBs should therefore be replaced by healthy alternatives such as water, to reduce risk of obesity and chronic diseases.

James, Janet; Thomas, Peter; Cavan, David; Kerr, David (2004):
Preventing childhood obesity by reducing consumption of carbonated drinks: cluster randomised controlled trial.
In: BMJ 328 (7450), S. 1237.

Abstract:
OBJECTIVE
To determine if a school based educational programme aimed at reducing consumption of carbonated drinks can prevent excessive weight gain in children.

DESIGN
Cluster randomised controlled trial.

SETTING
Six primary schools in southwest England.

PARTICIPANTS
644 children aged 7-11 years.

INTERVENTION
Focused educational programme on nutrition over one school year.
MAIN OUTCOME MEASURES
Drink consumption and number of overweight and obese children.

RESULTS
Consumption of carbonated drinks over three days decreased by 0.6 glasses (average glass size 250 ml) in the intervention group but increased by 0.2 glasses in the control group (mean difference 0.7, 95% confidence interval 0.1 to 1.3). At 12 months the percentage of overweight and obese children increased in the control group by 7.5%, compared with a decrease in the intervention group of 0.2% (mean difference 7.7%, 2.2% to 13.1%).

CONCLUSION
A targeted, school based education programme produced a modest reduction in the number of carbonated drinks consumed, which was associated with a reduction in the number of overweight and obese children.

Schlagwörter:
Body Mass Index; Carbonated Beverages/adverse effects/statistics & numerical data; Child; Cluster Analysis; Confidence Intervals; Female; Humans; Male; Obesity/prevention & control; Patient Education as Topic/methods

Zeitschriftenaufsatz
Johnson, Laura; Mander, Adrian P.; Jones, Louise R.; Emmett, Pauline M.; Jebb, Susan A.:

Is sugar-sweetened beverage consumption associated with increased fatness in children?
In: Nutrition 23 (7–8), S. 557–563.

Abstract:
OBJECTIVE
We assessed whether sugar-sweetened beverage (SSB) consumption increases fatness in British children.

METHODS
Data from a subsample of the Avon Longitudinal Study of Parents and Children were analyzed. Diet was assessed at ages 5 y (n = 521) and 7 y (n = 682) using 3-d diet diaries. Beverages were categorized into SSB, low energy, fruit juice, milk, and water. Fat mass was measured at age 9 y using dual-energy x-ray absorptiometry. The association between consumption of SSB at each age and fatness was examined using linear regression adjusted for potentially confounding variables.

RESULTS
SSB accounted for 15% of all drinks consumed and 3% of total energy intake at both ages. There was no evidence of an association between SSB consumption at 5 or 7 y of age and fatness at age 9 y. There was a small positive correlation between low-energy drinks at age 5 and 7 y and fatness at 9 y (age 5 y, rho = 0.21, P < 0.001; age 7 y, rho = 0.16, P < 0.001), which was explained by existing overweight status at ages 5 and 7 y.

CONCLUSION
In this cohort of British children there was no evidence of an association between SSB consumption at age 5 or 7 y and fatness at age 9 y. The positive relation between consumption of low-energy beverages and fatness at 9 y, which was explained by overweight status at 5 and 7 y, suggests that heavier children may consume low-energy beverages as part of an ineffective weight-control program.

Schlagwörter:
Absorptiometry, Photon/methods; Adipose Tissue/growth & development/radiography; Adiposity/drug effects; Beverages; Body Composition/drug effects; Body Mass Index; Body Weight; Child; Child Nutritional Physiological Phenomena; Child, Preschool; Cohort Studies; Dietary Sucrose/administration & dosage; Energy Intake; Female; Great Britain; Humans; Linear Models; Male; Nutrition Surveys; Obesity/etiology

Zeitschriftenaufsatz

Beverage consumption patterns of children born at different risk of obesity.
In: Obesity (Silver Spring) 16 (8), S. 1802–1808.
Abstract:
BACKGROUND
Increased intake of sugar-sweetened beverages and fruit juice has been associated with overweight in children.
OBJECTIVE
This study prospectively assessed beverage consumption patterns and their relationship with weight status in a cohort of children born at different risk for obesity.
METHODS AND PROCEDURES
Participants were children born at low risk (n = 27) or high risk (n = 22) for obesity based on maternal prepregnancy BMI (kg/m(2)). Daily beverage consumption was generated from 3-day food records from children aged 3-6 years and coded into seven beverage categories (milk, fruit juice, fruit drinks, caloric and non-caloric soda, soft drinks including and excluding fruit juice). Child anthropometric measures were assessed yearly.
RESULTS
High-risk children consumed a greater percentage of daily calories from beverages at age 3, more fruit juice at ages 3 and 4, more soft drinks (including fruit juice) at ages 3-5, and more soda at age 6 compared to low-risk children. Longitudinal analyses showed that a greater 3-year increase in soda intake was associated with an increased change in waist circumference, whereas a greater increase in milk intake was associated with a reduced change in waist circumference. There was no significant association between change in intake from any of the beverage categories and change in BMI z-score across analyses.
DISCUSSION
Children's familial predisposition to obesity may differentially affect their beverage consumption patterns. Future research should examine the extent to which dietary factors may play a role in pediatric body fat deposition over time.

Schlagwörter:
Animals; Beverages; Body Mass Index; Carbonated Beverages; Child; Child Nutritional Physiological Phenomena; Child, Preschool; Diet Records; Drinking Behavior; Female; Fruit; Humans; Longitudinal Studies; Male; Milk; Obesity/epidemiology/physiopathology; Prospective Studies; Risk Factors

Zeitschriftenaufsatz
Kvaavik, Elisabeth; Andersen, Lene Frost; Klepp, Knut-Inge (2005):
The stability of soft drinks intake from adolescence to adult age and the association between long-term consumption of soft drinks and lifestyle factors and body weight.

Abstract:
OBJECTIVES
To investigate the tracking of sugar-sweetened, carbonated soft drinks intake from age 15 to 33 years and the association between this intake and lifestyle factors and body weight.

DESIGN
A longitudinal study with 18-20 years of follow-up. Data about diet, physical activity, smoking and dieting were collected in 1981/1979, 1991 and 1999. Body weight and height were measured in 1981/1979 and self-reported in 1999.

SETTING
Oslo, Norway.

SUBJECTS
Four hundred and twenty-two men and women.

RESULTS
Tracking of soft drinks intake from adolescence into early adulthood (age 25 years) and from early adulthood into later adulthood (33 years) was moderate to high, while tracking from adolescence into later adulthood was low. Comparing those reporting a high intake of soft drinks in both 1991 and 1999 with those reporting a low intake at both times, male long-term high consumers were more likely to smoke (48 vs. 21%, P=0.002) and reported higher intakes of energy (12.2 vs. 10.2 MJ day(-1), P=0.005) and sugar (142 vs. 50 g day(-1), P<0.001) in 1999 than did long-term low consumers. Women high consumers were less likely to be physically active (14 vs. 42%, P=0.03) and had higher sugar intake (87 vs. 41 g day(-1), P<0.001) in 1999 than did women low consumers. There were no differences in body mass index, overweight or obesity in 1999 between long-term high and low consumers.

CONCLUSION
In this study, stability of soft drinks intake from age 15 to 25 years and from age 25 to 33 years was moderate to high, while from age 15 to 33 years it was low. Soft drinks intake from age 25 to 33 years was associated with smoking and physical inactivity, but not with body weight.

Schlagwörter:
Adolescent; Adult; Body Weight/drug effects; Carbonated Beverages; Dietary Carbohydrates/administration & dosage; Energy Intake; Exercise/physiology; Female; Humans; Life Style; Longitudinal Studies; Male; Norway; Smoking/epidemiology

Zeitschriftenaufsatz
Libuda, Lars; Alexy, Ute; Sichert-Hellert, Wolfgang; Stehle, Peter; Karaolís-Danckert, Nadina; Buyken, Anette E.; Kersting, Mathilde (2008):

Pattern of beverage consumption and long-term association with body-weight status in German adolescents—results from the DONALD study.

Abstract:
In the present study the relationship between the consumption of different beverage groups and body-weight status in 5 years of study participation in German adolescents was investigated. We used anthropometric and dietary data from 3 d weighed records of 244 subjects between 9 and 18 years of age participating in the Dortmund Nutritional and Anthropometric Longitudinally Designed (DONALD) study. Only subjects with at least four out of six possible weighed dietary records were considered. A repeated-measures regression model (PROC MIXED) was used to analyse the effect of beverage consumption on body-weight status. BMI standard deviation scores (BMI-SDS) and body fat percentage (%BF) were chosen as the dependent variables. In boys, energetic beverage consumption was not associated with BMI-SDS or %BF, neither cross-sectionally nor prospectively. In girls, baseline consumption of energetic beverages did not predict baseline BMI-SDS, baseline %BF, or change in either variable over the study period. However, an increase in energetic beverage consumption over the study period was associated with an increase in BMI-SDS (+0.070 SDS/MJ increase in energetic beverage consumption; P = 0.01). Separate consideration of regular soft drinks and fruit juices revealed that, in girls, BMI-SDS increased with increased fruit juice consumption (+0.096 SDS/MJ increase in fruit juice consumption; P = 0.01), and to a lesser extent with regular soft drink consumption (+0.055 SDS/MJ increase in regular soft drink consumption; P = 0.08). In conclusion, these results suggest that an increase in energetic beverage consumption may result in weight gain, at least in adolescent girls.

Schlagwörter:
Adolescent; Beverages; Body Composition; Body Mass Index; Body Weight; Diet Records; Drinking Behavior; Energy Intake; Female; Fruit; Germany; Humans; Linear Models; Longitudinal Studies; Male; Nutritional Status; Time Factors

Zeitschriftenaufsatz
Libuda, Lars; Kersting, Mathilde (2009):

Soft drinks and body weight development in childhood: is there a relationship?
In: Curr Opin Clin Nutr Metab Care 12 (6), S. 596–600.

Abstract:
PURPOSE OF REVIEW
The high sugar content of regular soft drinks brought up discussions on their influence on energy balance and body weight especially in childhood and adolescence. This review examines the evidence for a causal relationship between soft drink consumption and excess weight gain in childhood and identifies potential underlying mechanisms.
RECENT FINDINGS
Although results from cohort studies contrary to those from intervention studies are not univocal, there is evidence for a detrimental effect of soft drink consumption on body weight in childhood. This impact seems to be induced by an inadequate energy compensation after the consumption of sugar-containing beverages. Because of the
similar composition of high fructose corn syrup (HFCS) and sucrose, it is implausible that these types of sugar in soft drinks can cause substantially different effects on body weight.

**SUMMARY**
The replacement of soft drinks and other sugar-containing beverages such as fruit juices by noncaloric alternatives seems to be a promising approach for the prevention of overweight in childhood and adolescence. However, as the cause of overweight and obesity is multifactorial, the limitation of soft drink consumption needs to be incorporated in a complex strategy for obesity prevention.

**Schlagwörter:** Adipogenesis/drug effects; Adolescent; Body Weight/drug effects; Carbonated Beverages/adverse effects; Child; Child Nutritional Physiological Phenomena; Dietary Sucrose/administration & dosage/adverse effects; Energy Intake; Energy Metabolism; Female; Fructose/administration & dosage/adverse effects; Fruit; Humans; Obesity/etiology; Sucrose/administration & dosage/adverse effects; Weight Gain/drug effects; Zea mays

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**Zeitschriftenaufsatz**


**Konsum von Erfrischungsgetränken und Entwicklung des Körpergewichts im Kindes- und Jugendalter gibt es eine Verbindung.**

In: Aktuelle Ernährungsmedizin (33), S. 123–131.

**Abstract:**

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**Zeitschriftenaufsatz**

Lim, Sungwoo; Zoellner, Jamie M.; Lee, Joyce M.; Burt, Brian A.; Sandretto, Anita M.; Sohn, Woosung et al. (2009):

**Obesity and sugar-sweetened beverages in African-American preschool children: a longitudinal study.**

In: Obesity (Silver Spring) 17 (6), S. 1262–1268.

**Abstract:**
A representative sample of 365 low-income African-American preschool children aged 3-5 years was studied to determine the association between sugar-sweetened beverage consumption (soda, fruit drinks, and both combined) and overweight and obesity. Children were examined at a dental clinic in 2002-2003 and again after 2 years. Dietary information was collected using the Block Kids Food Frequency Questionnaire. A BMI score was computed from recorded height and weight. Overweight and obesity were defined by national reference age-sex specific BMI: those with an age-sex specific BMI>or=85th, but <95th percentile as overweight and those with BMI>or=95th age-sex specific percentile as obese. The prevalence of overweight was 12.9% in baseline, and increased to 18.7% after 2 years. The prevalence of obesity increased from 10.3 to 20.4% during the same period. Baseline intake of soda and all sugar-sweetened beverages were positively associated with baseline BMI z-scores. After adjusting for covariates, additional intake of fruit drinks and all sugar-sweetened beverages at baseline showed significantly higher odds of incidence of overweight over 2 years. Among a longitudinal cohort of African-
American preschool children, high consumption of sugar-sweetened beverages was significantly associated with an increased risk for obesity.

**Schlagwörter:**
African Americans/statistics & numerical data; Beverages; Body Mass Index; Carbonated Beverages; Child, Preschool; Dietary Sucrose/adverse effects; Female; Fruit; Humans; Incidence; Logistic Models; Longitudinal Studies; Male; Nutrition Surveys; Obesity/ethnology/etiology; Odds Ratio; Overweight/ethnology/etiology; Prevalence; Questionnaires; Risk Assessment; Risk Factors; Socioeconomic Factors; Time Factors

**Zeitschriftenaufsatz**
Linardakis, Manolis; Sarri, Katerina; Pateraki, Maria-Styliani; Sbokos, Manolis; Kafatos, Anthony (2008):
Sugar-added beverages consumption among kindergarten children of Crete: effects on nutritional status and risk of obesity.
In: BMC Public Health 8, S. 279.

**Abstract:**
OBJECTIVE
To assess the intake of sugar-added beverages such as soft drinks and commercially available fruit juices in kindergarten children, and to examine its association with obesity indices, physical activity levels and dietary habits.

METHODS
A total of 856 children aged 4-7 years living in Crete, Greece in 2004-5 were included in this cross-sectional study. Nutrient and food intake was assessed with the use of 3-day weighed food records. Body measurements were used in order to assess BMI and waist circumference, and moderate-to-vigorous physical activity was calculated with the use of a questionnaire.

RESULTS
Approximately 59.8% of all children consumed sugar-added beverages on a daily basis. High intake of sugar-added beverages (> 250 g/day) was associated with low intakes of calcium (p < 0.001), vitamin A and E (p < 0.010), fruits and vegetables (p = 0.007), and milk and yogurt (p = 0.048). Compared to non or low consumers, high consumers of sugar-added beverages (> 250 g/day) had higher BMI levels and two times greater risk of being overweight and/or obese (OR:2.35, p = 0.023).

CONCLUSION
High intake of sugar-added beverages in kindergarten children is associated with poor eating habits and inadequate nutrient intake, as well as increased risk for developing childhood obesity.

**Schlagwörter:**
Beverages; Body Mass Index; Child; Child, Preschool; Cross-Sectional Studies; Dietary Sucrose/administration & dosage/adverse effects; Energy Intake; Exercise; Female; Food Habits; Greece; Humans; Logistic Models; Male; Nutritional Status; Obesity/etiology/prevention & control; Questionnaires; Risk Factors; Sex Factors

**Zeitschriftenaufsatz**
Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis.
In: Diabetes Care 33 (11), S. 2477–2483.

**Abstract:**
OBJECTIVE
Consumption of sugar-sweetened beverages (SSBs), which include soft drinks, fruit drinks, iced tea, and energy and vitamin water drinks has risen across the globe. Regular consumption of SSBs has been associated with weight gain and risk of overweight and obesity, but the role of SSBs in the development of related chronic metabolic diseases, such as metabolic syndrome and type 2 diabetes, has not been quantitatively reviewed.

RESEARCH DESIGN AND METHODS
We searched the MEDLINE database up to May 2010 for prospective cohort studies of SSB intake and risk of metabolic syndrome and type 2 diabetes. We identified 11 studies (three for metabolic syndrome and eight for type 2 diabetes) for inclusion in a random-effects meta-analysis comparing SSB intake in the highest to lowest quantiles in relation to risk of metabolic syndrome and type 2 diabetes.

RESULTS
Based on data from these studies, including 310,819 participants and 15,043 cases of type 2 diabetes, individuals in the highest quantile of SSB intake (most often 1-2 servings/day) had a 26% greater risk of developing type 2 diabetes than those in the lowest quantile (none or <1 serving/month) (relative risk [RR] 1.26 [95% CI 1.12-1.41]). Among studies evaluating metabolic syndrome, including 19,431 participants and 5,803 cases, the pooled RR was 1.20 [1.02-1.42].

CONCLUSIONS
In addition to weight gain, higher consumption of SSBs is associated with development of metabolic syndrome and type 2 diabetes. These data provide empirical evidence that intake of SSBs should be limited to reduce obesity-related risk of chronic metabolic diseases.

Schlagwörter:
Beverages/adverse effects; Diabetes Mellitus, Type 2/epidemiology/etiology; Dietary Sucrose/adverse effects; Humans; Metabolic Syndrome X/epidemiology/etiology; Risk Factors

Zeitschriftenaufsatz
Intake of sugar-sweetened beverages and weight gain: a systematic review.

Abstract:
Consumption of sugar-sweetened beverages (SSBs), particularly carbonated soft drinks, may be a key contributor to the epidemic of overweight and obesity, by virtue of these beverages’ high added sugar content, low satiety, and incomplete compensation for total energy. Whether an association exists between SSB intake and weight gain is unclear. We searched English-language MEDLINE publications from 1966 through May 2005 for cross-sectional, prospective cohort, and experimental studies of the relation between SSBs and the risk of weight gain (ie, overweight, obesity, or both). Thirty publications (15 cross-sectional, 10 prospective, and 5 experimental) were selected on the basis of relevance and quality of design and methods. Findings from large cross-sectional studies, in conjunction with those from well-powered prospective cohort studies with long periods of follow-up, show a positive association between greater intakes of SSBs and weight gain and obesity in both children and adults. Findings from short-term feeding trials in adults also support an induction of positive energy balance and weight gain by intake of sugar-sweetened sodas, but these trials are few. A school-based intervention found significantly less soft-drink consumption and prevalence of obese and overweight children in the intervention group than in control subjects after 12 mo, and a recent 25-week randomized controlled trial in adolescents found further evidence linking SSB intake to body weight. The weight of epidemiologic and experimental evidence indicates that a greater consumption of SSBs is associated with weight gain and obesity. Although more research is needed, sufficient evidence exists for public health strategies to discourage consumption of sugary drinks as part of a healthy lifestyle.

Schlagwörter:
Adolescent; Adult; Aged; Aged, 80 and over; Beverages/adverse effects; Carbonated Beverages/adverse effects; Child; Child, Preschool; Clinical Trials as Topic; Cohort Studies; Cross-Sectional Studies; Dietary Sucrose/administration & dosage/adverse effects; Female; Humans; Male; Middle Aged; Obesity/epidemiology/dosage/adverse effects; Prospective Studies; Risk Factors; United States; Weight Gain/drug effects
Zeitschriftenaufsatz

Sugar-sweetened beverages and BMI in children and adolescents: reanalyses of a meta-analysis.

Schlagwörter:
Adolescent; Beverages; Body Mass Index; Child; Data Interpretation, Statistical; Dietary Sucrose/administration & dosage/adverse effects; Humans; Obesity/epidemiology/etiology; Predictive Value of Tests

Zeitschriftenaufsatz
Marr, Liz:

Soft drinks, childhood overweight, and the role of nutrition educators: let's base our solutions on reality and sound science.

Abstract:
The percentage of overweight children in the United States and other countries has now reached epidemic proportions. Both physical activity and food intake contribute to the energy equation, but research increasingly points to physical inactivity as the primary culprit in weight gain. Singling out and restricting specific foods and beverages are unlikely to be effective in reducing the prevalence of overweight children. Nutrition educators need to emphasize overall lifestyle, including physical activity, as well as caloric intake, in childhood overweight intervention efforts. Long-lasting solutions to the obesity epidemic must be comprehensive and must include all of the key stakeholders: children, parents, schools, health professionals, businesses, and community leaders and organizations. Nutrition educators can play a key role in developing wide-ranging and diverse coalitions, including food and beverage companies, designed to affect social change aimed at achieving healthy weight for children.

Schlagwörter:
Adolescent; Beverages; Carbonated Beverages/adverse effects; Child; Child Nutritional Physiological Phenomena; Energy Intake; Health Educators; Humans; Nutritional Sciences/education; Obesity/epidemiology/etiology; Professional Role; Schools; United States/epidemiology

Zeitschriftenaufsatz
Muckelbauer, Rebecca; Libuda, Lars; Clausen, Kerstin; Toschke, André Michael; Reinehr, Thomas; Kersting, Mathilde (2009):

Promotion and provision of drinking water in schools for overweight prevention: randomized, controlled cluster trial.

Abstract:
OBJECTIVE
The study tested whether a combined environmental and educational intervention solely promoting water consumption was effective in preventing overweight among children in elementary school.

METHODS
The participants in this randomized, controlled cluster trial were second- and third-graders from 32 elementary schools in socially deprived areas of 2 German cities. Water fountains were installed and teachers presented 4 prepared classroom lessons in the intervention group schools (N = 17) to promote water consumption. Control group schools (N = 15) did not receive any intervention. The prevalence of overweight (defined according to the International Obesity Task Force criteria), BMI SD scores, and beverage consumption (in glasses per day; 1 glass was defined as 200 mL) self-reported in 24-hour recall questionnaires, were determined before (baseline) and after the
intervention. In addition, the water flow of the fountains was measured during the intervention period of 1 school year (August 2006 to June 2007).

RESULTS
Data on 2950 children (intervention group: N = 1641; control group: N = 1309; age, mean +/- SD: 8.3 +/- 0.7 years) were analyzed. After the intervention, the risk of overweight was reduced by 31% in the intervention group, compared with the control group, with adjustment for baseline prevalence of overweight and clustering according to school. Changes in BMI SD scores did not differ between the intervention group and the control group. Water consumption after the intervention was 1.1 glasses per day greater in the intervention group. No intervention effect on juice and soft drink consumption was found. Daily water flow of the fountains indicated lasting use during the entire intervention period, but to varying extent.

CONCLUSION
Our environmental and educational, school-based intervention proved to be effective in the prevention of overweight among children in elementary school, even in a population from socially deprived areas.

Zeitschriftenaufsatz
Nissinen, Katja; Mikkilä, Vera; Männistö, Satu; Lahti-Koski, Marjaana; Räsänen, Leena; Viikari, Jorma; Raitakari, Olli T. (2009):
Sweets and sugar-sweetened soft drink intake in childhood in relation to adult BMI and overweight. The Cardiovascular Risk in Young Finns Study.

Abstract:
OBJECTIVE
To investigate the associations of BMI and overweight in adulthood with consumption of sweets and sugar-sweetened soft drinks in childhood and with the change in consumption between childhood and adulthood.

DESIGN
Longitudinal 21-year follow-up study of Finnish children and adolescents from childhood to adulthood.

SETTING
The Cardiovascular Risk in Young Finns Study, comprising participants from both eastern and western Finland.

SUBJECTS
Boys (n 967) and girls (n 1172) aged 3-18 years at baseline in 1980.

RESULTS
The increase in consumption of sugar-sweetened soft drinks from childhood to adulthood was directly associated with BMI in adulthood in women (b = 0.45, P = 0.0001) but not in men. In women, BMI increased by 0.45 kg/m2 for every 10-unit increase per month. Consumption of sweets and sugar-sweetened soft drinks in childhood and adolescence was not associated with BMI in adulthood. The change in consumption of sweets was not associated with BMI in adulthood. The increase in the consumption of sugar-sweetened soft drinks from childhood to adulthood was associated with being overweight (OR = 1.90, 95 % CI 1.38, 2.61) in women, but not in men. No association was found between overweight (BMI >or= 25 kg/m2) in adulthood and consumption of sweets in childhood or the change in consumption from childhood to adulthood.

CONCLUSIONS
We conclude that direct associations exist between adulthood overweight and BMI and an increase in consumption of sugar-sweetened soft drinks in women. Thus sugar-sweetened soft drinks consumption may be important when considering weight management in women.

Schlagwörter:
Adolescent; Adult; Body Mass Index; Carbonated Beverages/adverse effects; Child; Child, Preschool; Diet/adverse effects/standards; Diet Surveys; Dietary Sucrose/administration & dosage/adverse effects; Female; Finland; Humans; Longitudinal Studies; Male; Obesity/etiology; Overweight/etiology; Sex Factors; Young Adult
OBJECTIVE
The obesity epidemic in the United States continues to increase. Because obesity tends to track over time, the increase in overweight among young children is of significant concern. A number of eating patterns have been associated with overweight among preschool-aged children. Recently, 100% fruit juice and sweetened fruit drinks have received considerable attention as potential sources of high-energy beverages that could be related to the prevalence of obesity among young children. Our aim was to evaluate the beverage intake among preschool children who participated in the National Health and Nutrition Examination Survey 1999-2002 and investigate associations between types and amounts of beverages consumed and weight status in preschool-aged children.

METHODS
We performed a secondary analysis of the data from the National Health and Nutrition Examination Survey 1999-2002, which is a continuous, cross-sectional survey of a nationally representative sample of the noninstitutionalized population of the United States. It included the collection of parent reported demographic descriptors, a 24-hour dietary recall, a measure of physical activity, and a standardized physical examination. The 24-hour dietary recall was obtained in person by a trained interviewer and reflected the foods and beverages that were consumed by the participant the previous day. The National Health and Nutrition Examination Survey food groups were classified on the basis of the US Department of Agriculture’s Food and Nutrient Database for Dietary Studies. We reviewed the main food descriptors used and classified all beverages listed. One hundred percent fruit juice was classified as only beverages that contained 100% fruit juice, without sweetener. Fruit drinks included any sweetened fruit juice, fruit-flavored drink (natural or artificial), or drink that contained fruit juice in part. Milk included any type of cow milk and then was subcategorized by percentage of milk fat. Any sweetened soft drink, caffeinated or uncaffeinated, was categorized as soda. Diet drinks included any fruit drink, tea, or soda that was sweetened by low-calorie sweetener. Several beverages were removed from the analysis because of low frequency of consumption among the sample. Water was not included in the analysis because it is not part of the US Department of Agriculture’s Food and Nutrient Database categories. For the purposes of this analysis, the beverages were converted and reported as ounces, rather than grams, as reported by the National Health and Nutrition Examination Survey, to make it more clinically relevant. The child’s BMI percentile for age and gender were calculated on the basis of Centers for Disease Control and Prevention criteria and used to identify children’s weight status as underweight (< 5%), normal weight (5% to < 85%), at risk for overweight (85% to < 95%), or overweight (≥ or = 95%). Because of the small number of children in the underweight category, they were included in the normal-weight category for this analysis. Data were analyzed using SUDAAN 9.0.1 statistical software programs. SUDAAN allows for improved accuracy and validity of results by calculating test statistics for the stratified, multistage probability design of the National Health and Nutrition Examination Survey. Sample weights were applied to all analyses to account for unequal probability of selection from oversampling low-income children and black and Mexican American children. Descriptive and chi-squared analyses and analysis of covariance, adjusting for age, gender, ethnicity, household income, energy intake, and physical activity, were conducted.

RESULTS
All children who were aged 2 to 5 years were identified (N = 1572). Those with missing data were removed from additional analysis, resulting in a final sample of 1160 preschool children. Of the 1160 children analyzed, 579 (49.9%) were male. White children represented 35%, black children represented 28.3%, and Hispanic children represented 36.7% of the sample. Twenty-four percent of the children were overweight or at risk for overweight (BMI > or = 85%), and 10.7% were overweight (BMI ≥ or = 95%). There were no statistically significant differences in BMI between boys and girls or among the ethnicities. Overweight children tended to be older (mean age: 3.83 years) compared with the normal-weight children (mean age: 3.48 years). Eighty-three percent of children drank milk, 48% drank 100% fruit juice, 44% drank fruit drink, and 39% drank soda. Whole milk was consumed by 46.5% of the children, and 3.1% and 5.5% of the children consumed skim milk and 1% milk, respectively. Preschool children consumed a mean total beverage volume of 26.93 oz/day, which included 12.32 oz of milk, 4.70 oz of 100% fruit juice, 4.98 oz of fruit drinks, and 3.25 oz of soda. Weight status of the child had no association with the amount of total beverages, milk, 100% fruit juice, fruit drink, or soda consumed. There was no clinically significant association between the types of milk (percentage of fat) consumed and weight status. In analysis of covariance, daily total energy intake increased with increased consumption of milk, 100% fruit juice, fruit drinks, and soda.
CONCLUSIONS

On average, preschool children drank less milk than the 2005 Dietary Guidelines for Americans recommendation of 16 oz/day. Only 8.6% drank low-fat or skim milk, as recommended for children who are older than 2 years. On average, preschool children drank < 6 oz/day 100% fruit juice. Increased beverage consumption was associated with an increase in the total energy intake of the children but not with their BMI. Prospectively studying preschool children beyond 2 to 5 years of age, through their adiposity rebound (approximately 5.5-6 years) to determine whether there is a trajectory increase in their BMI, may help to clarify the role of beverage consumption in total energy intake and weight status.

Schlagwörter:
Beverages; Body Mass Index; Body Weight; Child Nutritional Physiological Phenomena; Child, Preschool; Energy Intake; Female; Humans; Male; Nutrition Surveys; Obesity/etiology/prevention & control; United States

Zeitschriftenaufsatz

Olsen, N. J.; Heitmann, B. L. (2009):

Intake of calorically sweetened beverages and obesity.
In: Obes Rev 10 (1), S. 68–75.

Abstract:
The prevalence of obesity has increased in the past 30 years, and at the same time a steep increase in consumption of soft drinks has been seen. This paper reviews the literature for studies on associations between intake of calorically sweetened beverages and obesity, relative to adjustment for energy intake. Conclusions from previous reviews have been inconsistent, but some included many cross-sectional studies or studies supported by sugar industry. A literature search was performed for prospective and experimental studies using Medline and Scirus. Fourteen prospective and five experimental studies were identified. The majority of the prospective studies found positive associations between intake of calorically sweetened beverages and obesity. Three experimental studies found positive effects of calorically sweetened beverages and subsequent changes in body fat. Two experimental studies did not find effects. Eight prospective studies adjusted for energy intake. Seven of these studies reported associations that were essentially similar before and after energy adjustment. In conclusion, a high intake of calorically sweetened beverages can be regarded as a determinant for obesity. However, there seems to be no support that the association between intake of calorically sweetened beverages and obesity is mediated via increased energy intake, and alternative biological explanations should be explored.

Schlagwörter:
Adipose Tissue; Beverages/adverse effects; Drinking; Energy Intake; Humans; Obesity/etiology; Research Support as Topic

Zeitschriftenaufsatz

Palmer, Julie R.; Boggs, Deborah A.; Krishnan, Supriya; Hu, Frank B.; Singer, Martha; Rosenberg, Lynn (2008):

Sugar-sweetened beverages and incidence of type 2 diabetes mellitus in African American women.

Abstract:
BACKGROUND
Type 2 diabetes mellitus is an increasingly serious health problem among African American women. Consumption of sugar-sweetened drinks was associated with an increased risk of diabetes in 2 studies but not in a third; however, to our knowledge, no data are available on African Americans regarding this issue. Our objective was to examine the association between consumption of sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes mellitus in African American women.

METHODS
A prospective follow-up study of 59,000 African American women has been in progress since 1995. Participants reported on food and beverage consumption in 1995 and 2001. Biennial follow-up questionnaires ascertained new diagnoses of type 2 diabetes. The present analyses included 43,960 women who gave complete dietary and weight information and were free from diabetes at baseline. We identified 2713 incident cases of type 2 diabetes mellitus during 338,884 person-years of follow-up. The main outcome measure was the incidence of type 2 diabetes mellitus.

RESULTS
The incidence of type 2 diabetes mellitus was higher with higher intake of both sugar-sweetened soft drinks and fruit drinks. After adjustment for confounding variables including other dietary factors, the incidence rate ratio for 2 or more soft drinks per day was 1.24 (95% confidence interval, 1.06-1.45). For fruit drinks, the comparable incidence rate ratio was 1.31 (95% confidence interval, 1.13-1.52). The association of diabetes with soft drink consumption was almost entirely mediated by body mass index, whereas the association with fruit drink consumption was independent of body mass index.

CONCLUSIONS
Regular consumption of sugar-sweetened soft drinks and fruit drinks is associated with an increased risk of type 2 diabetes mellitus in African American women. While there has been increasing public awareness of the adverse health effects of soft drinks, little attention has been given to fruit drinks, which are often marketed as a healthier alternative to soft drinks.

Schlagwörter:
Adult; African Americans; Aged; Beverages/adverse effects; Diabetes Mellitus, Type 2/ethnology/etiology; Dietary Sucrose/adverse effects; Female; Follow-Up Studies; Humans; Middle Aged; Prognosis; Prospective Studies; Questionnaires; Risk Factors; Sweetening Agents/adverse effects; United States/epidemiology

Zeitschriftenaufsatz
Sanigorski, Andrea M.; Bell, A. Colin; Swinburn, Boyd A. (2007):
Association of key foods and beverages with obesity in Australian schoolchildren.

Abstract:
OBJECTIVE
To examine the pattern of intake of key foods and beverages of children aged 4-12 years and the association with weight status.
DESIGN AND SETTING
A computer-assisted telephone interview was used to determine the intake of fruit, vegetables, packaged snacks, fast foods and sweetened drinks 'yesterday' and 'usually' as reported by parents/guardians of a representative sample of 2184 children from the Barwon South-Western region of Victoria, Australia.

RESULTS
Children who consumed >2-3, >3-4 and >4 servings of fruit juice/drinks 'yesterday' were, respectively, 1.7 (95% confidence interval (CI) 1.2-2.2), 1.7 (95% CI 1.2-2.5) and 2.1 (95% CI 1.5-2.9) times more likely to be overweight/obese compared with those who had no servings of fruit juice/drink 'yesterday', adjusted for age, gender and socio-economic status (SES). Further, children who had > or = 3 servings of soft drink 'yesterday' were 2.2 (95% CI 1.3-3.9) times more likely to be overweight/obese compared with those who had no servings of soft drink 'yesterday', adjusted for age, gender and SES. In addition, children who 'usually' drank fruit juice/drinks twice or more per day were 1.7 (95% CI 1.2-2.4) times more likely to be overweight/obese compared with those who drank these beverages once or less per week, adjusted for age, gender and SES. Although fast foods and packaged snacks were regularly eaten, there were no associations between weight status and consumption of these foods.

CONCLUSIONS
Intake of sweetened beverages was associated with overweight and obesity in this population of Australian schoolchildren and should be a target for intervention programmes aimed at preventing unhealthy weight gain in children.

Schlagwörter:
Beverages; Child; Child, Preschool; Confidence Intervals; Diet Surveys; Energy Intake/physiology; Female; Food Habits; Fruit; Humans; Male; Obesity/epidemiology/etiology; Odds Ratio; Social Class; Socioeconomic Factors; Vegetables; Victoria/epidemiology
Zeitschriftenaufsatz

Schulze, Matthias B.; Manson, JoAnn E.; Ludwig, David S.; Colditz, Graham A.; Stampfer, Meir J.; Willett, Walter C.; Hu, Frank B. (2004):

Sugar-sweetened beverages, weight gain, and incidence of type 2 diabetes in young and middle-aged women.

In: JAMA 292 (8), S. 927–934.

Abstract:
CONTEXT
Sugar-sweetened beverages like soft drinks and fruit punches contain large amounts of readily absorbable sugars and may contribute to weight gain and an increased risk of type 2 diabetes, but these relationships have been minimally addressed in adults.

OBJECTIVE
To examine the association between consumption of sugar-sweetened beverages and weight change and risk of type 2 diabetes in women.

DESIGN, SETTING, AND PARTICIPANTS
Prospective cohort analyses conducted from 1991 to 1999 among women in the Nurses' Health Study II. The diabetes analysis included 91,249 women free of diabetes and other major chronic diseases at baseline in 1991. The weight change analysis included 51,603 women for whom complete dietary information and body weight were ascertained in 1991, 1995, and 1999. We identified 741 incident cases of confirmed type 2 diabetes during 716,300 person-years of follow-up.

MAIN OUTCOME MEASURES
Weight gain and incidence of type 2 diabetes.

RESULTS
Those with stable consumption patterns had no difference in weight gain, but weight gain over a 4-year period was highest among women who increased their sugar-sweetened soft drink consumption from 1 or fewer drinks per week to 1 or more drinks per day (multivariate-adjusted means, 4.69 kg for 1991 to 1995 and 4.20 kg for 1995 to 1999) and was smallest among women who decreased their intake (1.34 and 0.15 kg for the 2 periods, respectively) after adjusting for lifestyle and dietary confounders. Increased consumption of fruit punch was also associated with greater weight gain compared with decreased consumption. After adjustment for potential confounders, women consuming 1 or more sugar-sweetened soft drinks per day had a relative risk [RR] of type 2 diabetes of 1.83 (95% confidence interval [CI], 1.42-2.36; P < .001 for trend) compared with those who consumed less than 1 of these beverages per month. Similarly, consumption of fruit punch was associated with increased diabetes risk (RR for > or =1 drink per day compared with <1 drink per month, 2.00; 95% CI, 1.33-3.03; P = .001).

CONCLUSION
Higher consumption of sugar-sweetened beverages is associated with a greater magnitude of weight gain and an increased risk for development of type 2 diabetes in women, possibly by providing excessive calories and large amounts of rapidly absorbable sugars.

Schlagwörter:
Adult; Beverages/adverse effects; Carbonated Beverages/adverse effects; Diabetes Mellitus, Type 2/epidemiology/etiology; Diet Surveys; Dietary Sucrose/adverse effects; Female; Health Surveys; Humans; Incidence; Prospective Studies; Risk; United States/epidemiology; Weight Gain

Zeitschriftenaufsatz

Sichieri, Rosely; Paula Trotte, Ana; Souza, Rita Adriana de; Veiga, Gloria V. (2009):

School randomised trial on prevention of excessive weight gain by discouraging students from drinking sodas.


Abstract:
OBJECTIVE
To determine whether an educational programme aimed at discouraging students from drinking sugar-sweetened beverages could prevent excessive weight gain.
DESIGN
Forty-seven classes in twenty-two schools were randomised as intervention or control.

SUBJECTS
Participants were 1140, 9-12-year-old fourth graders (435 in the intervention group and 608 in the control group). Sugar-sweetened beverages and juice intake were measured through one 24 h recall at baseline and another at the end of the trial. The main outcome was the change in BMI (BMI = weight (kg)/height (m2)), measured at the beginning and at the end of the school year. Intention-to-treat analysis was performed taking into account the cluster (classes) effect.

RESULTS
A statistically significant decrease in the daily consumption of carbonated drinks in the intervention compared to control (mean difference = -56 ml; 95 % CI -119, -7 ml) was followed by a non-significant overall reduction in BMI, P = 0.33. However, among those students overweight at baseline, the intervention group showed greater BMI reduction (-0.4 kg/m2 compared with -0.2 kg/m2 in the control group (P = 0.11)), and this difference was statistically significant among girls (P = 0.009). Fruit juice consumption was slightly increased in the intervention group (P = 0.08), but not among girls.

CONCLUSION
Decreasing sugar-sweetened beverages intake significantly reduced BMI among overweight children, and mainly among girls. Efforts to reduce energy intake through liquids need to emphasise overall sweetened beverages and addition of sugar on juices.

Schlagwörter:
Body Mass Index; Carbonated Beverages/adverse effects; Chi-Square Distribution; Child; Child Nutrition Sciences/education; Cluster Analysis; Female; Health Education/methods; Health Promotion/methods; Humans; Male; Overweight/prevention & control; Sex Factors; Statistics, Nonparametric; Students/psychology/statistics & numerical data; Weight Gain/drug effects

Zeitschriftenaufsatz
Sturm, Roland; Powell, Lisa M.; Chriqui, Jamie F.; Chaloupka, Frank J. (2010):
Soda taxes, soft drink consumption, and children’s body mass index.
In: Health Aff (Millwood) 29 (5), S. 1052–1058.

Abstract:
Taxes on sugar-sweetened beverages have been proposed to combat obesity. Using data on state sales taxes for soda and individual-level data on children, we examine whether small taxes are likely to change consumption and weight gain or whether larger tax increases would be needed. We find that existing taxes on soda, which are typically not much higher than 4 percent in grocery stores, do not substantially affect overall levels of soda consumption or obesity rates. We do find, however, that subgroups of at-risk children—children who are already overweight, come from low-income families, or are African American—may be more sensitive than others to soda taxes, especially when soda is available at school. A greater impact of these small taxes could come from the dedication of the revenues they generate to other obesity prevention efforts rather than through their direct effect on consumption.

Zeitschriftenaufsatz
Sweetman, Claire; Wardle, Jane; Cooke, Lucy (2008):
Soft drinks and ‘desire to drink’ in preschoolers.
In: Int J Behav Nutr Phys Act 5, S. 60.

Abstract:
Interest in soft drink consumption has increased following a dramatic rise in intake over recent years. Research to date has focused primarily on general trends in consumption or on understanding the mechanism by which soft drink consumption may be linked to weight gain. It is clear however that there is considerable individual variability in the extent to which soft drinks are consumed and factors potentially influencing intake have received little attention. This study examines how the Child Eating Behaviour Questionnaire (CEBQ) construct ‘Desire to Drink’
(DD) relates to drink consumption, preferences and BMI-SDS. Three hundred and forty six same-sex twin children (mean age 11.2 years; s.d. 0.54; 56% female; 53% dizygotic) were weighed, measured and reported their liking for milk, water, fruit juice, fruit squash and sweetened soft drinks. Mothers reported on their child’s drink consumption and completed the CEBQ. Scores on the CEBQ DD subscale were not significantly related to child BMI-SDS in this sample. Children scoring higher on DD had higher preferences for sugar-sweetened soft drinks ($p = 0.016$), fruit squash ($p = 0.042$) and milk ($p = 0.020$) than children scoring lower on the scale. DD was also positively related to more frequent consumption of sugar-sweetened soft drinks ($p = 0.017$) and low calorie soft drinks ($p = 0.003$). No relationship was observed between DD scores and liking for or intake of water or 100% fruit juice. These findings suggest that the construct desire to drink in children is related to a liking for consuming sweetened drinks, and does not appear to simply denote greater thirst or hunger. This may have important implications for the ongoing development of dietary patterns and weight status in the longer term through an increased preference for sweet things in the mouth and a failure to compensate for calories provided by drinks.

Zeitschriftenaufsatz
Soft drink consumption and excess weight gain in Australian school students: results from the Nepean study.
In: Int J Obes (Lond) 30 (7), S. 1091–1093.

Abstract:
We studied the relation between soft drink/cordial (a sweet, flavoured, concentrated syrup that is mixed with water to taste), fruit juice/drink and milk consumption in mid-childhood, and body mass index (BMI) status in early adolescence in a contemporary Australian cohort. In 1996/7, 268 children (136 males) were recruited from western Sydney at baseline (mean+/−s.d.: 7.7+/−0.6 years), and at follow-up 5 years later (13.0+/−0.2 years). Height and weight were measured at both time periods and overweight and obesity defined using the International Obesity Task Force criteria. Beverage consumption was calculated from a 3-day food record at baseline. Median carbohydrate intake from soft drink/cordial was 10 g higher ($P=0.002$) per day in children who were overweight/obese at follow-up compared to those who had an acceptable BMI at both baseline and follow-up. Intakes of soft drink/cordial in mid-childhood, but not fruit juice/fruit drink and milk, were associated with excess weight gain in early adolescence.

Schlagwörter:
Animals; Body Height; Body Mass Index; Body Weight; Carbonated Beverages/adverse effects/statistics & numerical data; Child; Dietary Carbohydrates/administration & dosage; Female; Follow-Up Studies; Food Habits; Humans; Male; Milk; Obesity/etiology; Overweight; Weight Gain

Zeitschriftenaufsatz
Valente, Hugo; Teixeira, Vitor; Padrão, Patricia; Bessa, Mariana; Cordeiro, Tânia; Moreira, André et al. (2011):
Sugar-sweetened beverage intake and overweight in children from a Mediterranean country.

Abstract:
OBJECTIVE
To assess the association between sugar-sweetened beverage (SSB) consumption and overweight in children from a Mediterranean country.

DESIGN
The children’s dietary intake was measured using a semi-quantitative FFQ completed by the parents. Overall, 2512 questionnaires were returned and 837 children were removed, leaving a final sample of 1675 children, aged between 5 and 10 years. Height and weight were measured according to international standards, and BMI was calculated. The definition of overweight and obesity was based on average centiles according to the International Obesity Task Force cut-offs. To determine the magnitude of the association between SSB consumption and
overweight, OR estimates, including CI, were computed using unconditional logistic regression, adjusting for confounders.

SETTING
Elementary schools throughout the city of Porto, Portugal.

SUBJECTS
We invited 5867 children, randomly selected, and their parents to participate in the study. Of those schools that agreed to take part, 3391 parents signed and returned the fully filled out consent form.

RESULTS
The prevalence of overweight (including obesity) was 36.6 % for girls and 38.8 % for boys. With regard to SSB consumption (serving/d), no differences between with overweight and non-overweight children were found even after adjustment for confounders (1-2 servings/d: OR = 1.67, 95 % CI 0.76, 3.66, in girls; OR = 1.63, 95 % CI 0.76, 3.47, in boys; and >2 servings/d: OR = 0.63, 95 % CI 0.33, 1.22, in girls; OR = 0.64, 95 % CI 0.33, 1.52, in boys).

CONCLUSIONS
The intake of SSB was not associated with increased risk of overweight in Portuguese schoolchildren.

Schlagwörter:
Beverages/statistics & numerical data; Body Mass Index; Child; Child Nutritional Physiological Phenomena; Child, Preschool; Confidence Intervals; Dietary Sucrose/administration & dosage; Female; Humans; Male; Nutrition Surveys; Obesity/epidemiology/etiology/prevention & control; Odds Ratio; Overweight/epidemiology/etiology/prevention & control; Portugal/epidemiology; Prevalence; Questionnaires

Zeitschriftenaufsatz
Vanselow, Michelle S.; Pereira, Mark A.; Neumark-Sztainer, Dianne; Raatz, Susan K. (2009):

Adolescent beverage habits and changes in weight over time: findings from Project EAT.

Abstract:
BACKGROUND
Obesity in adolescence has been increasing in the past several decades. Beverage habits among adolescents include increased consumption of sugar-sweetened beverages and decreased consumption of milk.

OBJECTIVE
This study aimed to examine the association between beverage consumption and 5-y body weight change in 2294 adolescents.

DESIGN
Project EAT (Eating Among Teens) is a 5-y longitudinal study of eating patterns among adolescents. Surveys were completed in 1998-1999 (time 1) and in 2003-2004 (time 2). Multivariable linear regression was used to examine the association between beverage consumption at time 2 and change in body mass index from time 1 to time 2, with adjustments for age, socioeconomic status, race, cohort, physical activity, sedentary behavior, coffee, tea, time 1 body mass index, and beverage variables.

RESULTS
In prospective analyses, consumption of beverages was not associated with weight gain, except for consumption of low-calorie soft drinks (positive association, P = 0.002) and white milk (inverse association, P = 0.03), but these associations did not appear to be a monotonic linear dose-response relation. The positive association with low-calorie soft drinks was no longer present after adjustment for dieting and parental weight-related concerns, which suggests that the use of low-calorie soft drinks is a marker for more general dietary behaviors and weight concerns.

CONCLUSIONS
We showed no association between sugar-sweetened beverage consumption, juice consumption, and adolescent weight gain over a 5-y period. A direct association between diet beverages and weight gain appeared to be explained by dieting practices. Adolescents who consumed little or no white milk gained significantly more weight than their peers who consumed white milk. Future research that examines beverage habits and weight among adolescents should address portion sizes, adolescent maturation, and dieting behaviors.

Schlagwörter:
Adolescent; Animals; Beverages; Body Mass Index; Energy Intake; Female; Food Habits; Humans; Male; Milk; Weight Gain
Soda consumption and overweight status of 2-year-old Mexican-American children in California.

Abstract:
OBJECTIVE
The prevalence of overweight in United States children, 2 to 5 years old, has increased 2-fold since 1975, with the highest prevalence in Mexican Americans. The objective of this study was to determine the association between current soda consumption and overweight in 2-year-old Mexican-American children.

RESEARCH METHODS AND PROCEDURES
The Center for the Health Assessment of Mothers and Children of Salinas study is a longitudinal study of the health of low-income Latino pregnant women and their children living in the Salinas Valley, CA. Six hundred pregnant women were enrolled (October 1999 to October 2000), and their children were followed until 2 years of age. This cross-sectional analysis includes the 354 children who completed the 2-year follow-up interview. Standing height (centimeters) and weight (grams) were measured at 2 years. Overweight was defined as > or =95th percentile of the sex-specific BMI for each child's age.

RESULTS
Fifty-five (15.5%) children were overweight. Over half (56%) reported consuming any soda in the last week. After covariate adjustment, compared with no soda consumption, <1 soda/d was not related to overweight (adjusted odds ratio, 0.97; 95% confidence interval, 0.47, 1.99), but > or =1 soda/d was significantly associated with overweight (adjusted odds ratio, 3.39; 95% confidence interval, 1.43, 8.07), and the test for trend was significant (p = 0.02).

DISCUSSION
At 2 years of age, the prevalence of overweight among the Center for the Health Assessment of Mothers and Children of Salinas cohort is higher than the national prevalence estimate for Mexican-American 2- to 5-year-old children and is significantly associated with current soda consumption. Interventions to reduce consumption of soda in young Mexican-American children should be considered.

Schlagwörter:
Adult; Body Mass Index; California/epidemiology; Carbonated Beverages/adverse effects; Child, Preschool; Confidence Intervals; Cross-Sectional Studies; Energy Intake; Female; Follow-Up Studies; Food Habits; Humans; Infant; Infant, Newborn; Longitudinal Studies; Male; Mexican Americans; Nutrition Surveys; Obesity/epidemiology/etiology; Odds Ratio; Overweight; Poverty; Pregnancy; Prevalence
Soft drinks and weight gain: how strong is the link?

In: Medscape J Med 10 (8), S. 189.

Abstract:
CONTEXT
Soft drink consumption in the United States has tripled in recent decades, paralleling the dramatic increases in obesity prevalence. The purpose of this clinical review is to evaluate the extent to which current scientific evidence supports a causal link between sugar-sweetened soft drink consumption and weight gain.

EVIDENCE ACQUISITION
MEDLINE search of articles published in all languages between 1966 and December 2006 containing key words or medical subheadings, such as "soft drinks" and "weight." Additional articles were obtained by reviewing references of retrieved articles, including a recent systematic review. All reports with cross-sectional, prospective cohort, or clinical trial data in humans were considered.

EVIDENCE SYNTHESIS
Six of 15 cross-sectional and 6 of 10 prospective cohort studies identified statistically significant associations between soft drink consumption and increased body weight. There were 5 clinical trials; the two that involved adolescents indicated that efforts to reduce sugar-sweetened soft drinks slowed weight gain. In adults, 3 small experimental studies suggested that consumption of sugar-sweetened soft drinks caused weight gain; however, no trial in adults was longer than 10 weeks or included more than 41 participants. No trial reported the effects on lipids.

CONCLUSIONS
Although observational studies support the hypothesis that sugar-sweetened soft drinks cause weight gain, a paucity of hypothesis-confirming clinical trial data has left the issue open to debate. Given the magnitude of the public health concern, larger and longer intervention trials should be considered to clarify the specific effects of sugar-sweetened soft drinks on body weight and other cardiovascular risk factors.

Schlagwörter:
Carbonated Beverages/statistics & numerical data; Clinical Trials as Topic/statistics & numerical data; Feeding Behavior; Health Behavior; Humans; Obesity/epidemiology; Prevalence; Risk Assessment/methods; Risk Factors; Weight Gain