

Search Plan and Results

Question

[Is intake of fruits and vegetables associated with adiposity in children? \(DGAC 2010\)](#)

Date Searched

7/1/2009

Inclusion Criteria

- Publication date January 1, 2004 through July 1, 2009
- English language
- Human subjects
- Children (zero to 18 years)
- Included at least one outcome measure of adiposity (e.g., body weight, body mass index, skinfolds, percent body fat).

Exclusion Criteria

- Conducted in developed countries
- Published in journals that are not peer-reviewed
- Included no measure of adiposity (e.g., body weight, body mass index, skinfolds, percent body fat)
- Involved exclusively children less than two years old or adolescents over 18 years old
- Treatment trial conducted for less than eight weeks (not including duration of follow-up)
- Prevention trial conducted for less than six months (not including duration of follow-up)
- Treatment trial involved fewer than 10 subjects total (or fewer than 10 in the intervention group)
- Prevention trial involved fewer than 60 subjects total (or fewer than 30 in the intervention group)
- Treatment trials involving pharmacological interventions (because of lack of research in these areas)
- Cross-sectional studies.

Search Terms: Search Vocabulary

("Fruit"[Mesh:NoExp] OR "Vegetables"[mh]) AND ("Body Weights and Measures"[Mesh] OR "Body Mass Index"[Mesh] OR "Adiposity"[mh] OR "Overweight"[mh] OR "Obesity"[mh] OR "Weight Gain"[mh]) AND juice

("Fruit"[majr:NoExp] OR "Vegetables"[majr]) AND ("Adiposity"[majr] OR "Overweight"[majr] OR "Obesity"[majr] OR "Weight Gain"[majr] OR "Body Weights and Measures"[Majr])

Electronic Databases

PubMed.

Total hits from all electronic database searches: 159

Total articles identified to review from electronic databases: 29

Articles Identified Via Handsearch or Other Means

Articles identified via hand search: Two

Articles identified via the ADA Evidence Review on this topic: Three.

Summary of Articles Identified to Review

Number of Primary Articles Identified: 6

Number of Review Articles Identified: 0

Total Number of Articles Identified: 6

Number of Articles Reviewed but Excluded: 28

List of Articles Included for Evidence Analysis

Included from the NEL Search (3)

Epstein LH, Paluch RA, BeecherMD, Roemmich JN. [Increasing healthy eating vs. reducing high energy-dense foods to treat pediatric obesity.](#) *Obesity (Silver Spring)*. 2008 Feb; 16(2): 318-326. PMID: 18239639; PMCID: PMC2408744.

Faith MS, Dennison BA, Edmunds LS, Stratton HH. [Fruit juice intake predicts increased adiposity gain in children from low-income families: Weight status-by-environment interaction.](#) *Pediatrics*. 2006 Nov; 118(5): 2, 066-2, 075. PMID: 17079580.

Field AE, Gillman MW, Rosner B, Rockett HR, Colditz GA. [Association between fruit and vegetable intake and change in body mass index among a large sample of children and adolescents in the United States.](#) *Int J Obes Relat Metab Disord*. 2003 Jul; 27(7):

821-826. PMID: 12821968.

Included from the ADA Evidence Review (3)

Newby PK, Peterson KE, Berkey CS, Leppert J, Willett WC, Colditz GA. Dietary composition and weight change among low-income preschool children. *Arch Pediatr Adolesc Med.* August 2003; 157(8): 759-764.

Sugimori H, Yoshida K, Izuno T, Miyakawa M, Suka M, Sekine M, Yamagami T, Kagamimori S. Analysis of factors that influence body mass index from ages 3 to 6 years: A study based on the Toyama cohort study. *Pediatr Int.* 2004 Jun; 46(3): 302-310.

Wang Y, Ge K, Popkin BM. Why do some overweight children remain overweight, whereas others do not? *Public Health Nutr.* 2003 Sep; 6(6): 549-558.

List of Excluded Articles with Reason

Article (A-K)	Reason for Exclusion
Bandera EV, Kushi LH, Moore DF, Gifkins DM, McCullough ML. Fruits and vegetables and endometrial cancer risk: A systematic literature review and meta-analysis. <i>Nutr Cancer.</i> 2007; 58(1): 6-21. Review. PMID: 17571962.	Did not answer the question; examined the relationship between fruit and vegetable intake and cancer.
Bas M, Kiziltan G. Relations among weight control behaviors and eating attitudes, social physique anxiety, and fruit and vegetable consumption in Turkish adolescents. <i>Adolescence.</i> 2007 Spring; 42(165): 167-178. PMID: 17536481.	Study population not from a developed country as defined by the Human Development Index.
Burrows TL, Warren JM, Colyvas K, Garg ML, Collins CE. Validation of overweight children's fruit and vegetable intake using plasma carotenoids. <i>Obesity (Silver Spring).</i> 2009 Jan; 17(1): 162-168. Epub 2008 Nov 6. PMID:18997681.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.
de Sa J, Lock K. Will European agricultural policy for school fruit and vegetables improve public health? A review of school fruit and vegetable programmes. <i>Eur J Public Health.</i> 2008 Dec; 18(6): 558-568. Epub 2008 Aug 21. Review. PMID: 18719006.	Did not answer the question; reviewed the literature on intervention sot increase fruit and vegetable intake.
Gallaway MS, Jago R, Baranowski T, Baranowski JC, Diamond PM. Psychosocial and demographic predictors of fruit, juice and vegetable consumption among 11- to 14-year-old Boy Scouts. <i>Public Health Nutr.</i> 2007 Dec; 10(12): 1, 508-1, 514. Epub 2007 Aug 9. PMID: 17686203.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.

Grant R, Bilgin A, Zeuschner C, Guy T, Pearce R, Hokin B, Ashton J. The relative impact of a vegetable-rich diet on key markers of health in a cohort of Australian adolescents. <i>AsiaPac J Clin Nutr.</i> 2008; 17(1): 107-115. PMID:18364335.	Did not include fruit and vegetable intake as a measured outcome.
Hendy HM, Williams KE, Camise TS, Alderman S, Ivy J, Reed J. Overweight and average-weight children equally responsive to "Kids Choice Program" to increase fruit and vegetable consumption. <i>Appetite.</i> 2007 Nov; 49(3): 683-686. Epub 2007 Jun 29. PMID: 17669545.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.
Jamelske E, Bica LA, McCarty DJ, Meinen A. Preliminary findings from an evaluation of the USDA Fresh Fruit and Vegetable Program in Wisconsin schools. <i>WMJ.</i> 2008 Aug; 107(5): 225-230. PMID: 18777990.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.
Jansen E, Mulkens S, Emond Y, Jansen A. From the Garden of Eden to the land of plenty. Restriction of fruit and sweets intake leads to increased fruit and sweets consumption in children. <i>Appetite.</i> 2008 Nov; 51(3): 570-575. Epub 2008 Apr 22. PMID: 18501474.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.
Kral TV, Stunkard AJ, Berkowitz RI, Stallings VA, Moore RH, Faith MS. Beverage consumption patterns of children born at different risk of obesity. <i>Obesity</i> (Silver Spring). 2008 Aug; 16(8): 1, 802-1, 808. Epub 2008 May 29. PMID: 18535546.	Did not include fruit and vegetable intake as a measured outcome.

Article (L-S)	Reason for Exclusion
Lakkakula AP, Zanovec M, Silverman L, Murphy E, Tuuri G. Black children with high preferences for fruits and vegetables are at less risk of being at risk of overweight or overweight. <i>J Am Diet Assoc.</i> 2008 Nov;108(11):1912-5. PMID: 18954583.	Did not include fruit and vegetable intake as a measured outcome.
Leahy KE, Birch LL, Fisher JO, Rolls BJ. Reductions in entrée energy density increase children's vegetable intake and reduce energy intake. <i>Obesity</i> (Silver Spring). 2008 Jul;16(7):1559-65. Epub 2008 May 1. PMID: 18451770.	Did not include adiposity intake as a measured outcome.
Libuda L, Alexy U, Sichert-Hellert W, Stehle P, Karaolis-Danckert N, Buyken AE, Kersting M. Pattern of beverage consumption and long-term association with body-weight status in German adolescents--results from the DONALD study. <i>Br J Nutr.</i> 2008 Jun;99(6):1370-9. Epub 2007 Nov 23. PMID: 18034911.	Did not include fruit and vegetable intake as a measured outcome.

<p>Lorson BA, Melgar-Quinonez HR, Taylor CA. Correlates of fruit and vegetable intakes in US children. <i>J Am Diet Assoc</i>. 2009 Mar; 109(3): 474-478. PMID:19248865.</p>	<p>Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.</p>
<p>Lowry R, Lee SM, McKenna ML, Galuska DA, Kann LK. Weight management and fruit and vegetable intake among US high school students. <i>J Sch Health</i>. 2008 Aug; 78(8): 417-424; quiz 455-457. PMID: 18651928.</p>	<p>Did not answer the question; examined the relationship between fruit and vegetable intake and common weight management behaviors.</p>
<p>Mikkelsen TB, Osler M, Orozova-Bekkevold I, Knudsen VK, Olsen SF. Association between fruit and vegetable consumption and birth weight: a prospective study among 43, 585 Danish women. <i>Scand J Public Health</i>. 2006; 34(6): 616-622. PMID: 17132595.</p>	<p>Study subjects are adults.</p>
<p>Newby PK. Plant foods and plant-based diets: protective against childhood obesity? <i>Am J Clin Nutr</i>. 2009 May; 89(5): 1, 572S-1, 587S. Epub 2009 Mar 25. Review. PMID: 19321559.</p>	<p>Study is a narrative review.</p>
<p>Nicklas TA, O'Neil CE, Kleinman R. Association between 100% juice consumption and nutrient intake and weight of children aged 2 to 11 years. <i>Arch Pediatr Adolesc Med</i>. 2008 Jun; 162(6): 557-565. PMID: 18524747.</p>	<p>Did not include fruit and vegetable intake as a measured outcome.</p>
<p>Nystrom AA, Schmitz KH, Perry CL, Lytle LA, Neumark-Sztainer D. The relationship of weight-related perceptions, goals, and behaviors with fruit and vegetable consumption in young adolescents. <i>Prev Med</i>. 2005 Feb; 40(2): 203-208. PMID: 15533530.</p>	<p>Study design is cross-sectional.</p>
<p>O'Connor TM, Yang SJ, Nicklas TA. Beverage intake among preschool children and its effect on weight status. <i>Pediatrics</i>. 2006 Oct; 118(4): e1, 010-e1, 018. PMID: 17015497.</p>	<p>Did not include fruit and vegetable intake as a measured outcome.</p>
<p>Ramón R, Ballester F, Iñiguez C, Rebagliato M, Murcia M, Esplugues A, Marco A, García de la Hera M, Vioque J. Vegetable but not fruit intake during pregnancy is associated with newborn anthropometric measures. <i>J Nutr</i>. 2009 Mar; 139(3): 561-567. Epub 2009 Jan 21. PMID: 19158218.</p>	<p>Study subjects are adults.</p>

Ribaya-Mercado JD, Maramag CC, Tengco LW, Blumberg JB, Solon FS. Relationships of body mass index with serum carotenoids, tocopherols and retinol at steady-state and in response to a carotenoid-rich vegetable diet intervention in Filipino schoolchildren. <i>Biosci Rep.</i> 2008 Apr; 28(2): 97-106. PMID: 18384277.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.
Roseman MG, Yeung WK, Nickelsen J. Examination of weight status and dietary behaviors of middle school students in Kentucky. <i>J Am Diet Assoc.</i> 2007; 107: 1, 139-1, 145.	Study design is cross-sectional.
Sanigorski AM, BellAC, Swinburn BA. Association of key foods and beverages with obesity in Australian schoolchildren. <i>Public Health Nutr.</i> 2007 Feb; 10(2): 152-157. PMID: 17261224.	Study design is cross-sectional.

Article (T-Z)	Reason for Exclusion
te Velde SJ, Twisk JW, Brug J. Tracking of fruit and vegetable consumption from adolescence into adulthood and its longitudinal association with overweight. <i>Br J Nutr.</i> 2007 Aug; 98(2): 431-438. Epub 2007 Apr 16. Erratum in: <i>Br J Nutr.</i> 2007 Oct; 98(4): 871. PMID: 17433126.	Study subjects are adults.
Thomson CA, Rock CL, Giuliano AR, Newton TR, Cui H, Reid PM, Green TL, Alberts DS. Longitudinal changes in body weight and body composition among women previously treated for breast cancer consuming a high-vegetable, fruit and fiber, low-fat diet. <i>Eur J Nutr.</i> 2005 Feb; 44(1): 18-25. Epub 2004 Mar 5. PMID: 15309460.	Study subjects are adults.
Tohill BC, Seymour J, Serdula M, Kettel-Khan L, Rolls BJ. What epidemiologic studies tell us about the relationship between fruit and vegetable consumption and body weight. <i>Nutr Rev.</i> 2004 Oct; 62(10): 365-374. Review. PMID: 15508906.	Study is a narrative review. Abstract does not specify if review includes literature on children.
Vatanparast H, Baxter-Jones A, Faulkner RA, Bailey DA, Whiting SJ. Positive effects of vegetable and fruit consumption and calcium intake on bone mineral accrual in boys during growth from childhood to adolescence: the University of Saskatchewan Pediatric Bone Mineral Accrual Study. <i>Am J Clin Nutr.</i> 2005 Sep; 82(3):700-706. PMID: 16155286.	Did not answer the question; did not examine the relationship between fruit and vegetable intake and adiposity.

