

Hydrate for Health: A Call for Healthy Beverages in Health Care

Promoting human and environmental health by encouraging healthy beverage selections

Health Care without Harm (HCWH) is an international coalition of organizations working to transform the health care sector, without compromising patient safety or care, so that it is ecologically sustainable and no longer a source of harm to public health and the environment. HCWH's Healthy Food in Health Care (HFHC) Program works with hospitals across the country to build a healthier, more sustainable food system, providing education and resources to make the connection between the food they serve and the health of their patients, staff and community.

Hospitals can play an important role by modeling healthy behaviors in the communities they serve. With their substantial purchasing dollars, hospitals can have a significant impact on market trends to support overall health. Despite the charge to “first, do no harm”, many facilities serve high calorie, nutrient-poor food and beverages on patient trays, in cafeterias, and in vending machines. This document explores the negative health and environmental impacts associated with sugar sweetened beverage consumption, and the opportunities for hospitals to take a leadership role in transitioning to healthier options for their patients, staff and the community... hydration for health.

Many beverages provide a significant caloric contribution to a total diet and have been implicated in the degradation of health rather than the support of wellness. Sugar sweetened beverages (SSBs) contribute to the increased prevalence of obesity and associated chronic diseases that go along with weight gain. The dramatic increase in the consumption of SSBs in the U.S. is fueled by advertising, a significant rise in availability, and the fact that SSBs are relatively inexpensive compared to healthier food and beverage options. Additionally, the production, consumption and waste associated with sugar sweetened and bottled beverages have numerous negative environmental consequences that are often overlooked.

Connecting Sugar Sweetened Beverages and Chronic Disease

Scientific studies overwhelmingly show that consumption of sugar-sweetened beverages (SSBs) leads to weight gain and obesity in children and adults.^{1,2,3} Not only are Americans consuming more calories from SSBs than in the past, they are also consuming more total calories since many people do not cut back on other kinds of food when they drink sweetened beverages.⁴ Furthermore, people may be eating even more food as a result of increasing SSB consumption. This is evidenced by animal studies showing that sweet foods alter brain chemistry, increasing cravings for food more generally, even when energy needs have been met.^{5,6,7,8}

The sugars in SSBs are high glycemic carbohydrates, which are rapidly absorbed from the intestine, causing a sharp spike in blood sugar and insulin levels. Over time, diets with a high glycemic load lead to insulin resistance and chronically higher blood sugar levels, particularly among overweight individuals. Studies show that consuming higher amounts of SSBs significantly increases the risk of developing diabetes and metabolic syndrome.⁹ Metabolic syndrome is an increasingly common diagnosis that includes combinations of insulin resistance and high blood sugar, high blood pressure, abnormal blood lipids, and obesity. In addition, growing evidence shows that higher consumption of SSBs

What are Sugar-Sweetened Beverages?

Sugar-sweetened beverages (SSBs) include any beverage to which a caloric sweetener (any type of sugar) is added. These beverages may include: soda, other carbonated soft drinks, juice drinks, sports drinks, energy drinks, sweetened milk or milk alternatives, and sweetened tea or coffee drinks.

There are several types of caloric sweeteners. Look for one or more of these in the list of ingredients: high-fructose corn syrup, cane sugar, fructose, fruit juice concentrate, glucose, sucrose, honey, brown sugar, dextrose and corn sweetener.

A typical 20-ounce soda contains about 16 teaspoons of sugar and 250 calories.

increases the risk of inflammation and coronary heart disease.¹⁰

Health care institutions throughout the country recognize the urgent need to reduce rates of obesity and chronic illness as well as their associated health care costs. Obesity prevalence in the U.S. is rapidly increasing,^{11,12} with one in three adults and one in six children now obese.^{13,14} Being obese or overweight puts adults at risk for early death and over 30 diseases, including heart attacks, strokes, arthritis, Type-2 diabetes, gall bladder disease, and certain cancers.^{15,16} The annual medical cost of obesity has doubled in less than a decade, and now represents nearly 10% of all annual medical spending.¹⁷ Sugar-sweetened beverages now account for more than 10% of total calories consumed in the U.S. diet.¹⁸ For all of these reasons, the American Heart Association and the USDA's 2010 Dietary Guidelines for Americans have called for sharp reductions in the consumption of sugar sweetened beverages, the largest contributing dietary source of added sugar.^{19,20}

High Fructose Corn Syrup: Bad for You, Bad for the Environment

Similar to any other form of added sugar, high fructose corn syrup (HFCS) is bad for your health when consumed in excessive amounts. Many types of soda pop, juice, energy drinks, tea and coffee drinks utilize HFCS as a sweetener. Drinking

products like these on a regular basis can be detrimental to not only an individual's health but to the environment as well. **Between 2000 and 2010 an average of 2.55 million acres of corn, roughly two and half times the size of the state of Rhode Island, were grown each year just to produce HFCS.**²¹ Massive amounts of chemical fertilizers and pesticides are used to grow corn in the United States. The use of nitrogen fertilizers increased from 58 pounds per acre of corn in 1964 to 140 pounds per acre in 2010,²² which amounts to approximately 357 million pounds of nitrogen used in 2010 for HFCS production alone. In the industrial agriculture system, the use of large amounts of nitrogen fertilizer is a major cost of production and can contribute to nitrate contamination of surface and ground water, resulting in eutrophication (oxygen-depleted dead zones such as the one in the Gulf of Mexico) and threats to human health (impaired thyroid hormone production and methemoglobinemia in infants [blue baby syndrome]) from contaminated drinking water.

Atrazine, a commonly used herbicide used in the U.S., is used extensively in corn production. Over 65 million pounds of atrazine are applied to corn crops each year²³ with potentially 2.85 million pounds used on acres dedicated to HFCS alone. Studies show widespread contamination from atrazine in watersheds and drinking water throughout the U.S., with highest levels in corn-producing areas

of the Midwest.^{24,25,26,27} Atrazine causes feminization of male frogs and other classes of vertebrates at exposure levels currently present in the environment where atrazine is used in agriculture.^{28,29} In humans whose drinking water is contaminated with atrazine, some evidence finds that it interferes with fetal growth and development.^{30,31} Currently banned in the European Union, atrazine and its risks to human health are under review by the U.S. EPA. By reducing consumption of beverages sweetened with HFCS, there is a subsequent reduction of the impact that production of this sweetener has on our health and the environment.

Hidden Consequences: SSB Alternatives Not Always So Sweet

As health care institutions look for alternatives to sugar sweetened beverages, two common choices are fruit juice and diet beverages. While 100 percent fruit juice offers nutritional benefits not found in most SSBs, consuming naturally sweetened beverages still contributes to overall daily caloric intake. Fruit juice lacks the fiber content found in the whole food causing a larger increase in blood sugar levels. Studies have shown decreased satiety and increased calorie consumption throughout the day as a result of consuming beverages instead of the whole food.^{32,33} As part of a healthy beverage program, efforts should be made to offer these beverages in smaller 4 ounce serving sizes.

Diet beverages do not contain the sugar or calories that regular sugar-sweetened beverages do, but they are still not considered a healthy drink alternative. Diet sodas, like regular sodas, provide no nutritive value and also contain caffeine and phosphoric acid, a combination that increases the risk of bone loss.³⁴ Diet beverages have a sweeter taste than sugar sweetened beverages so over time taste buds have been shown to increase preference for sweet drinks and sweet foods.³⁵ Emerging yet controversial research

Reducing Sugar Sweetened Beverages In August, 2010, Cleveland Clinic's expansive health care operation serving approximately 5 million guests per year and 42,000 employees had removed all sugar sweetened beverages from catering, vending, and retail outlets. Initiated by the hospital's CEO, the phase-out spanned the 45 days prior and was supported by the Clinic's mission to provide an environment of total wellness with patient health as the focus. All incoming contracted retail outlets and newly negotiated contracts prohibited the sale of sugar sweetened beverages. Although the facility saw a drop in sales after initiating the ban, they have recouped 81% of their losses after only 1 year post implementation with expectations for a full financial rebound in the coming year.

Implementing a Healthy Beverage Program St. Elizabeth Medical Center, a 272 bed urban hospital in Massachusetts, launched a comprehensive healthy beverage program in March of 2011 removing over 20 varieties of sugar sweetened beverages from coolers and fountain machines. Healthier beverages were incentivized through preferential placement in coolers and vending machines along with a pricing structure shift. Vending machines were replaced with clear glass faces to reduce beverage advertising and introduce a color-coded, point of purchase beverage education system informing consumers about healthy beverage choices. To increase free water access, the hospital installed an additional filtered water machine in the main cafeteria. The facility's cafeteria sales were not negatively impacted. They showed a 49% decrease in SSBs purchased with a 3.8% increase in overall sales to date. Future plans include the reduction or potential elimination of SSBs from patient menus.

has indicated a potential link between diet beverage consumption and the development of metabolic syndrome and type 2 Diabetes.³⁶

Water: The Optimal Beverage

Every system in the body depends on water. Water flushes toxins out of vital organs, carries nutrients to your cells, and regulates body temperature.³⁷ Water is one of the best tools for weight loss, when it replaces high-calorie drinks.

Access to affordable, safe drinking water is becoming increasingly difficult around the world. By supporting and promoting publicly owned water infrastructure, the health care community can send a powerful message about every person's right to clean and safe water. **In the U.S., tap water has been proven to be just as safe, or safer, than bottled water.** Actually, nearly half of all bottled water sold in the United States is tap water that companies put in plastic bottles and sell at huge profits, according to a new report by Food & Water Watch. Tap water's share of the bottled water market grew from 32.7% in 2000 to 47.8% in 2009 (the rest is spring water), according to the group, which based its analysis on the bottled water industry's own data. In all, 2.5 billion gallons of municipal tap water, which taxpayers pay to treat, is bottled and sold for \$1 (or often much more) per

gallon, when the same municipal tap water typically costs a penny or less per gallon ... and is conveniently delivered to your home or facility.^{38, 39}

Regulations for bottled water are generally weaker for some microbial contaminants. A recent study by Environmental Working Group found a variety of pollutants in common bottled water brands such as fertilizer and pharmaceutical residues along with cancer causing chemicals.⁴⁰ Bottled water, defined as a "food" in federal regulations, is under the authority of the Food and Drug Administration (FDA), while tap water, under much stricter standards is regulated by the Environmental Protection Agency (EPA) and closely monitored by the local public utility. The EPA does not allow any residuals from human waste in city tap water and also mandates that local water treatment plants provide city residents with a detailed account of tap water's source and the results of any testing, including contaminant level violations.⁴¹ Bottled water companies are under no such directives.

Reducing Your Beverage Footprint

Waste management has become a serious global issue, both in terms of the effects on our environment and human health. Landfills continue to grow to unmanageable sizes and

Drink Up: Promoting Access to Water in Your Hospital

Provide "sips" of educational information on:

- Tap Water vs. Bottled Water: cost savings and environmental benefits.
- The impacts of bottled water on both health and the environment

Cafeterias

- Increase the number of filtered tap water stations available
- Provide easy access and clear signage to water fountains and dispensers
- Provide an incentive one day per week (Water Wednesdays) by offering a meal discount to those who utilize a reusable water bottle on their tray in the cafeteria
- Provide eco-friendly reusable water containers (for free or for purchase, with facility logo) and indicate availability through signage

Catering

- Offer water infused or garnished with citrus slices or herbs in large dispensers
- Serve ice and water in pitchers at meetings with reusable drinking glasses or compostable cups

Patient Areas

- Use filtered tap water with reusable cups instead of bottled water on patient trays

Reducing Bottled Water Bottled water can cost up to 4,000 times more than tap water. For Kaiser Permanente, the switch from 5-gallon drums to 301 water-filtration systems represented cost savings of 49%, or \$61,400 annually. For Santa Rosa Memorial Hospital in Santa Rosa, CA, the phase-out of single-use bottled water for on-site catering events, in patient use areas and nursing units, represents a savings of \$66,000 annually. Santa Rosa is now moving to a phase-out of bottled water sales in their cafeterias, to be replaced with the sale of reusable plastic mugs with the hospital logo and filtered water stations.

recycling rates lag far behind in keeping up with the waste generated.

Polyethylene terephthalate (PET) bottles are accepted by most municipal recycling programs yet each year in the U.S., only 23% are actually recycled and about 2 million tons of PET bottles end up in landfills. These plastic bottles take thousands of years to biodegrade, leaching toxic contaminants into local groundwater supplies. It is not just the waste generated by the sheer numbers of plastic bottles thrown into the trash every year, significant amounts of energy are used in the production and shipping of **bottled beverages. Plastic bottle production in the U.S. currently requires approximately 17 million barrels of oil annually, enough to run 1 million cars for a whole year.** Six times as much water is used in the production of bottled water as actually ends up inside the bottles, threatening local stream and groundwater supplies where water is bottled.⁴²

Studies show that a variety of chemical substances that mimic the hormone estrogen can leach into water contained in PET bottles.⁴³ One potential source of this estrogenic activity is antimony, which is used as a catalyst in the production of PET.^{44,45} Bisphenol A (BPA), a chemical found in lining of most soda cans and hard plastic bottles has also been shown to have estrogenic and other toxic properties. Animal tests reveal that BPA has a variety of adverse health effects even at low levels of exposure, including developmental disorders and increased risk of both prostate and breast cancer. Widespread human exposures are of increasing concern. Utilizing a refillable

stainless steel bottle will prevent you from paying the hefty cost of bottled water and avoid exposure to these chemicals. You'll also conserve resources and keep waste out of our landfills.

You can help protect the health of your patients, staff, visitors and the environment by implementing a Healthy Beverage Program with the following steps:

1. Contact the Healthy Food in Health Care regional organizer in your area for resources and support. Let them know that you are working on a Healthy Beverage Program at your health care facility.
2. Create a multi-disciplinary "Healthy Beverage Task Force," with representatives from multiple departments (e.g., Food Service, Patient Care, Senior Management, Facilities, etc).
3. Conduct a simple beverage audit to identify where and when SSBs and public drinking water is made available throughout your health care facility. Document what types of beverages are available, where they are located and how frequently they are used (or total sales per month) at each location and event.
4. Utilizing your beverage audit, create a Healthy Beverage Program that works to reduce the amounts of SSBs and bottled beverages sold and served.
5. Incorporate a healthy beverage policy into your broader sustainable food policy. Include purchasing specifications that meet your healthy beverage

criteria. Establish goals with timelines for the various stages of implementing your policy and plan. Use the Green Guide for Health Care (GGHC) Food Service Credit Toolkit to benchmark and track your success (See Food Service Credit 1.2 and 4.4).

Goals may include:

- Increase and promote access to filtered water stations and healthier beverages such as: organic or rBGH-free dairy, unsweetened beverages, 100% fruit juice (in 4 oz servings), fair trade or organic coffee and tea
 - Reduce bottled beverage offerings/vending machines throughout your facility
 - Reduce or eliminate SSBs at catered events, holiday events, and special occasions
 - Make choosing healthy easy! Adjust beverage prices so that healthier beverages are priced lower than SSBs.
 - Reduce the amount of shelf space given over to SSBs and highlight healthier options by placing them at eye level
 - Educate employees, patients and visitors about the human health and environmental impacts of high consumption of SSBs and bottled beverages
 - Sell reusable beverage containers at affordable prices in the cafeteria and gift shop and give them away at special events
 - Create a carbonated water station that incorporates "flavor essence" rather than sugar and artificial sweeteners into beverages
6. Contact your beverage vendors and discuss the healthy beverage criteria you have established.

Citations and references included in the full online version available at www.healthyfoodinhealthcare.org



12355 Sunrise Valley Dr.
Suite 680
Reston, VA 20191
Phone: 703.860.9790
Fax: 703.860.9795
www.noharm.org
info@hcwh.org

ADDITIONAL RESOURCES

- 1 Center for Science in Public Interest (CSPI): Life's Sweeter with Fewer Sugary Drinks Challenge - www.fewersugarydrinks.org
- 2 Center for Disease Control (CDC) : Rethink your Drink - http://www.cdc.gov/healthyweight/healthy_eating/drinks.html
- 3 Food & Water Watch: www.foodandwaterwatch.org
- 4 Corporate Accountability International: www.stopcorporateabuse.org
- 5 EPA: Ground Water and Drinking Water - <http://water.epa.gov/drink/index.cfm>
- 6 American Heart Association: Frequently asked Questions About Sugar - http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyDietGoals/Frequently-Asked-Questions-About-Sugar_UCM_306725_Article.jsp

ENDNOTES

- 1 Malik VS, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review. *Am J Clin Nutr.* 2006 Aug;84(2):274-88.
- 2 Vartanian LR, Schwartz MB, Brownell KD. Effects of soft drink consumption on nutrition and health: a systematic review and meta-analysis. *Am J Public Health.* 2007;97(4):667-675.
- 3 Ludwig DS, Peterson KE, Gortmaker SL. Relation between consumption of sugar sweetened drinks and childhood obesity: a prospective, observational analysis. *Lancet.* 2001; 357: 505-08.
- 4 DiMaggio DP, Mattes RD. Liquid versus solid carbohydrate: effects on food intake and body weight. *Int J Obes Relat Metab Disord.* 2000 Jun;24(6):794-800.
- 5 Spangler R, Wittkowski KM, Goddard NL, Avena NM, Hoebel BG, Leibowitz SF. Opiate-like effects of sugar on gene expression in reward areas of the rat brain. *Mol Brain Res.* 2004; 124: 134-142.
- 6 Kelley AE, Bakshi VP, Haber SN, Steininger TL, Will MJ, Zhang M. Opioid modulation of taste hedonics within the ventral striatum. *Physiol Behav.* 2002; 76: 365-377.
- 7 Pelchat ML, Johnson A, Chan R, Valdez J, Ragland JD. Images of desire: food-craving activation during fMRI. *Neuroimage.* 2004; 23: 1486-1493.
- 8 Anderzhanova E, Covasa M, Hajnal A. Altered basal and stimulated accumbens dopamine release in obese OLETF rats as a function of age and diabetic status. *Am J Physiol Regul Integr Comp Physiol.* 2007; 293: 03-R611.
- 9 Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. *Diabetes Care.* 2010; 33(11):2477-2483
- 10 Malik VS, Popkin BM, Bray GA, Despres JP, Hu FB. Sugar-sweetened beverages, obesity, type 2 diabetes mellitus, and cardiovascular disease risk. *Circulation.* 2010 Mar 23;121(11):1356-64.
- 11 Flegal KM, Carroll MD, Ogden CL, Johnson CL. Prevalence and trends in obesity among U.S. adults, 1999-2000. *JAMA.* 2002 Oct 9; 288 (14): 1723-1727.
- 12 Ogden CL, Carroll MD, Curtin LR, McDowell MA, Tabak CJ, Flegal KM. Prevalence of overweight and obesity in the United States, 1999-2004. *JAMA.* 2006 Apr 5; 295 (13); 1549-55.
- 13 National Center for Health Statistics. Health, United States, 2009: With Special Feature Medical Technology. Hyattsville, MD. 2010.
- 14 Cynthia L. Ogden; Margaret D. Carroll; Lester R. Curtin; Molly M. Lamb; Katherine M. Flegal. Prevalence of High Body Mass Index in U.S. Children and Adolescents, 2007-2008 *JAMA.* 2010;303(3):242-249.
- 15 Vahratian, Anjel. Prevalence of Overweight and Obesity among Women of Childbearing Age: Results from the 2002 National Survey of Family Growth. *Maternal and Child Health Journal* 2009; 13(2): 268-273.
- 16 Centers for Disease Control and Prevention. Overweight and Obesity Health Consequences. Available at: <http://www.cdc.gov/obesity/causes/health.html>. Accessed: August 27, 2011
- 17 Finkelstein EA, Trogdon JG, Cohen JW, Dietz W. Annual medical spending attributable to obesity: payer- and service-specific estimates. *Health Affairs* 2009; 28(12):w822-w831.
- 18 Wang YC, Ludwig DS, Sonneville K and Fortmaker SL. Impact of change in sweetened caloric beverage consumption on energy intake among children and adolescents. *Arch Pediatric Adolesc Med.* 2009; 163(4): 336-343
- 19 Johnson RK, et al. Dietary Sugars Intake and Cardiovascular Health: A Scientific Statement From the American Heart Association. *Circulation.* 2009; 120:1011-1020. Available online at: <http://circ.ahajournals.org/content/120/11/1011.full.pdf>

- 20 USDA. Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2010.: Appendix E-1 Major Conclusions. Available at: <http://www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/DGAC/Report/E-Appendix-E-1-Conclusions.pdf>. Accessed August 17, 2011
- 21 Calculations were derived from USDA's Economic Research Service's Sugar and Sweeteners Yearbook Tables (Tables 27, 29, and 30): <http://www.ers.usda.gov/Briefing/Sugar/Data.htm>; Sugar and Sweeteners: Background: <http://www.ers.usda.gov/briefing/sugar/background.htm>; and National Agricultural Statistics Service's Crop and Plant Database. Accessed August 2011
- 22 United States Department of Agriculture (USDA); Economic Research Service. Available at <http://www.ers.usda.gov/Data/FertilizerUse/>. Accessed August 1, 2011
- 23 United States EPA. Atrazine Background. http://www.epa.gov/opp00001/factsheets/atrazine_background.htm (accessed on July 29, 2011).
- 24 Natural Resources Defense Council. Atrazine: Poisoning the Well. Available at: <http://www.nrdc.org/health/atrazine/>. Accessed August 1, 2011
- 25 Wu M, Quirindongo M,, Sass J, Wetzler A. Still Poisoning the Well. National Resource Defense Council. April 2010. Available at: <http://www.nrdc.org/health/atrazine/files/atrazine10.pdf>. Accessed August 1, 2011
- 26 Environmental Protection Agency. Atrazine Update. Available at: http://www.epa.gov/opp00001/reregistration/atrazine/atrazine_update.htm. Accessed August 1, 2011
- 27 United States Department of Agriculture. Monitoring Herbicides in Midwest Drinking Water. <http://www.ars.usda.gov/is/pr/2006/060130.htm>. Accessed August 1, 2011
- 28 Hayes T, Anderson L, Beasley V, de Solla S, et al. Demasculinization and feminization of male gonads by atrazine: Consistent effects across vertebrate classes. *J Steroid Biochem Mol Biol.* 2011 Mar 23. [Epub ahead of print]
- 29 Hayes, T., et al., Hermaphroditic, demasculinized frogs after exposure to the herbicide atrazine at low ecologically relevant doses. *Proc. Natl. Acad. Sci. USA,* 2002; 99: 5476-5480.
- 30 Ochoa-Acuna H, Frankenberger J, Hahn L, Carbajo C. Drinking-water herbicide exposure in Indiana and prevalence of small-for-gestational-age and preterm delivery. *Environ Health Perspect* 2009; 117(10):1619-1624.
- 31 Munger R, Isacson P, Hu S, Burns T. Intrauterine growth retardation in Iowa communities with herbicide-contaminated drinking water supplies. *Environ Health Perspect* 1997; 105(3):308-314.
- 32 Bolton RP, Heaton KW, Burroughs LF. The role of dietary fiber in satiety, glucose, and insulin: studies with fruit and fruit juice. *Am J Clin Nutr.* 1981 Feb; 34(2):211-7.
- 33 Flood-Obbagy JE, Rolls BJ. The effect of fruit in different forms on energy intake and satiety at a meal. *Appetite.* 2009 Apr; 52(2):416-22. Epub 2008 Dec 6.
- 34 Tucker KL, Morita K, Qiao N, Hannan MT, Cupples LA, Kiel DP. Colas, but not other carbonated beverages, are associated with low bone mineral density in older women: The Framingham Osteoporosis Study. *Am J Clin Nutr.* 2006 Oct; 84(4):936-42.
- 35 Ludwig DS. Artificially sweetened beverages: cause for concern. *JAMA.* 2009 Dec 9; 302(22):2477-8.
- 36 Nettleton JA, et al. Diet soda intake and risk of incident metabolic syndrome and type 2 diabetes in the Multi-Ethnic Study of Atherosclerosis (MESA). *Diabetes Care.* 2009 April; 32(4):688-94. Epub 2009 Jan 16.
- 37 The Mayo Clinic. www.mayoclinic.com/health/water/NU00283. Accessed: August 15, 2011
- 38 Food and Water Watch. Bluewashing: Why the Bottled Water Industry's EcoFriendly Claims Don't Hold Water. March 22, 2010. Available at: <http://www.foodandwaterwatch.org/reports/bluewashing/>. Accessed: August 27, 2011
- 39 Food and Water Watch. Water=Life: How Privatization Undermines the Human Right to Water. July 2011. Available at: <http://documents.foodandwaterwatch.org/RighttoWater-FoodWaterWatch.pdf>. Accessed: August 27, 2011
- 40 Naidenko O, Leiba N, Sharp R, Houlihan J. Bottled Water Quality Investigation: 10 Major Brands, 38 Pollutants. Environmental Working Group. October 2008. Available at: <http://www.ewg.org/reports/BottledWater/Bottled-Water-Quality-Investigation>. Accessed: August 27, 2011
- 41 All About Water. Available at: <http://www.allaboutwater.org/>. Accessed: August 24, 2010.
- 42 Food and Water Watch. Water=Life: How Privatization Undermines the Human Right to Water. July 2011. Available at: <http://documents.foodandwaterwatch.org/RighttoWater-FoodWaterWatch.pdf>. Accessed August 27, 2011
- 43 Wagner M, Oehlmann J. Endocrine disruptors in bottled mineral water: Estrogenic activity in the E-screen. *J Steroid Biochem Mol Biol* 2010 Nov 2 [Epub ahead of print]
- 44 Sax L. Polyethylene terephthalate may yield endocrine disruptors. *Environ Health Perspect* 2010; 118(4):445-448.
- 45 Choe S, Kim S, Kim H, Lee J, et al. Evaluation of estrogenicity of major heavy metals. *Sci Total Environ* 2003; 312(1-3):15-21.