Health Benefits of Urban Agriculture

Anne C. Bellows, PhD *Rutgers, The State University of New Jersey*; **Katherine Brown, PhD** *Southsi*

and policy development have blossomed, although an accep

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Community Food Security

Urban agriculture contributes to community food security.[41] Times of war and conflict render tenuous our dependence on distant food sources, especially in this post-9/11 world.[42] A local agri-food system provides a relatively secure and more locally controlled source of food. Better interaction between local consumers and farmers increases awareness of local food options. Enhanced communication also augments knowledge and commitment to healthy, sustainable, and secure food products and practices.[43]

Urban gardening contributes to local food security. Gardeners report that sharing food with friends, families, neighbors, and/or needy members of their community in need is one of the important reasons that they grow produce.[44] This generosity has been organized into programs that maximize contributions to soup kitchens and pantries, for example, through the "plant-a-row" project that encourages gardeners to set aside a specific space for donations.[45]

Strategies to buy locally have surged.[46] States and regions have instituted "buy local" policies.[47] Community supported agriculture (CSA) has linked buyer collectives with local farmers; some CSAs strive to make opportunities available to low-income groups.[48] Local farmers are in such demand that many large and small towns now compete to have farmers participate in their farmers markets.[49] Low income group access to fresh and local produce is increasingly addressed.[50] U.S. federal programs encourage direct marketing of fresh produce through farm stands and farmers markets. Many of these programs also incorporate voucher and electronic benefits transfer (EBT) redemption programs[51] at the markets to augment fruit and vegetable consumption in vulnerable population groups -- seniors, low-income, and single parent s, lo

social space of the community.[54] Gardening is a lifetime activity, and its health advantages span generations of gardeners. It is associated with satisfying labor, physical and mental relaxation, socializing, and a means to produce food and beauty. Used well, gardening can be a key element in successful health intervention programs because it addresses simultaneously the physical, mental, spiritual, and social health of individuals and their communities.[55]

For many, farming is a labor of love as well as a source of income. In recognition of the financial potential of farming, a number of programs now exist to expand opportunities to new farmers – many of whom are based in peri-urban environments – who have difficulty with start up costs. These programs promote community wellness: clean, open space landscapes, access to local fresh foods, and healthy local economies with local economic multiplier effects. Some programs specifically target immigrant communities, many of whose members come to North America with extensive farming knowledge and experience. These individuals often find great personal satisfaction in returning to farm operations and they typically grow crops and raise livestock wanted by their ethnic peers; foods that may otherwise be difficult to find.[56] foods teeee

women, cancer survivors, and those generally sedentary.[63] Gardening and nature-adventure education in after-school programs increased energy expenditures of 12 year olds by 60 percent.[64]

Research shows that gardening is a preferred form of exercise across age, gender, and ethnicity.[65] Overall, older persons do more gardening than younger ones.[66] Research does not always capture gardening as exercise, because some gardeners perceive it as part of a day's leisure or labor activities and not a separate activity in the category of "exercise." In one study, men identified gardening as "exercise" more often than did women though women and men reported similar amounts of time gardening.[67] Many women may associate gardening with gendered household food-related chores rather than exercise.

The beneficial effects of outdoor activity and exposure to sunlight need more research. Sunlight could influence susceptibility to a number of chronic diseases. For example, sunlight deficiency may increase blood cholesterol. One study shows that gardening is associated with lower blood cholesterol during the summer growing season but not in the winter.[68]

Mental Health

Working with plants and in the outdoors benefits the mental health, mental outlook, and personal wellness of individuals.[69] Cultivation activities trigger both illness prevention and healing responses. Health professionals use plants and gardening materials to help patients of diverse ages with mental illness improve social skills, self-esteem, and use of leisure time.[70] The field of horticulture therapy promotes plant-human relationships to induce relaxation and to reduce stress, fear and anger, blood pressure, and muscle tension.[71] Given the literature on positive outcomes of plant-human relationships, the American Community Gardening Association has expressed surprise that more gardens have not been dedicated to mental health and rehabilitative intervention.[72]

III. Community Health: Building Safe, Healthy, and Green Environments

Urban environments have the capacity to integrate our need to live in a balance of built and open spaces. Constructing green zones is important for a robust city as building housing, service infrastructure, and industrial and commercial spaces. Community and educational land dedicated to food production encourages participation in the vigor of a positive urban

[63] Evenson

environment. The practice of cultivation improves the urban physical environments as measured by air quality, range of bio-diversity, and soil quality.

Social Life in Urban Neighborhoods

Gardens and farms enhance the informal and the formal economies of social environment The effort to develop and sustain urban food production inside cities builds social capital – trust, civic engagement, the development of community leaders, and the sharing of goods ("vegetable capital"), services, and information.[73] Bringing people together, building community, and improving neighborhoods are some of the reasons gardening empowers its participants.[74] Social engagement is positively correlated with personal attention to health care and wellness.[75] Food production teaches job skills and offers entrepreneurial opportunities.[76] Reports find that low-income communities particularly value the community building benefits of urban agriculture.[77] Innovative prison garden programs strive to improve personal health and mental outlook through pride in nurturing the life of a garden and understanding and connecting nutrition and bodily self-respect.[78]

Urban community gardens and farms help overcome social, health, and environmental justice challenges.[79] Safe and pleasant neighborhoods promote active lifestyles and outdoor exercise that counteract the physical passivity associated with the obesity epidemic. Participating in beautifying a neighborhood builds a constructive, collective consciousness. The presence of vegetable gardens in inner-city neighborhoods is positively correlated with decreases in crime, trash dumping, juvenile delinquency, fires, violent deaths, and mental illness.[80] Gardens link different sectors of a city—youth, elders, and diverse race, ethnic, and socioeconomic groups.[81] Gardeners, especially older ones, feel safe and have a purpose for leaving their households and engaging in a wider landscape; they literally and figuratively broaden their horizons.[82] Adults feel more secure allowing young persons to move freely in safe, green, cared-for, and populated environments.

Urban Agriculture in Schools

Extensive and mounting evidence shows that school-based garden programs have significant health effects on young people. In these non-traditional learning labs, youth become familiar with good and healthy food, especially the fruits and vegetables critical to reducing obesity and chronic diseases. It is precisely these foods that are missing from our children's usual diets. School garden programs teach a skill and a lifetime hobby that provides exercise, mental stimulation, and social interactions. Children receive practical entrees to biological and

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[73] Hinrichs and Lyson (Forthcoming); Lyson 2004; Von Hassell 2002; Feenstra et al. 1999; McGuinn and Relf 2001; Oh 1999; Littman 1996; Lewis 1991.
[74] McGuinn and Relf 2001; Hanna 2000; Feenstra et al. 1999; Kuo et al. 1998a; Kuo et al. 1998b; Lewis 1991; Blair et al. 1991.
[75] Greenberg and Schneider 1996.
[76] Halweil 2005; Kaufman and Bailkey 2000; Feenstra et al. 1999; Francis et al. 1994.
[77] Armstrong-A 2000.
[78] Sneed 1998; Project on Human Development in Chicago Neighborhoods, http://www.hms.harvard.edu/chase/projects/chicago/index.html..
[79] Von Hassell 2002.
[80] Hurley 2004; Patel 2003; McKay 1998.
[81] Predny and Relf 2000; Feenstra et al. 1999; The Food Project, http://www.thefoodproject.org/.
[82] Milligan et al. 2004.

environmental sciences, math, geography, and social studies. Additionally, reports show that these advantages accrue to students that have trouble succeeding in school as well as those who excel.[83]

Farm-to-school and farm-to–college programs establish market relationships with local farms to secure the freshest and in season fruits, vegetables, and other products for consumption in school and college cafeterias. These programs reflect a grassroots endeavor by parents, teachers, school health officials, students, farmers, and others. Their efforts counter a trend to offer students fast food and highly processed menus in schools –the very foods linked to the obesity epidemic. At the national, state, and municipal levels, the public sector is joining grassroots organizers to develop policy and pass legislation to enable and promote farm-to-school or farm-to-college programs.[84]

A schoolyard garden can deliver produce to its school's cafeteria in order to provide an exceedingly dynamic linkage between nutrition, education, and learned behaviors. Such a program exists in the Berkeley, California school system and represents a progression *from* already functioning schoolyard gardens and a successful farm-to-school program *to* new curriculum development that benefits the health and education of its students.[85]

Growing Urban Green Zones

Gardeners and farmers "create nature" and enjoy being "in nature" within urban built environments. They work hard to improve the physical environment of their neighborhoods and communities.[86] The beauty gardeners develop enhances their physical environment that in turn advances gardeners' psychosocial[87] as well as physical health. One study found that access to gardens, along with improved housing fixtures and dwelling type, location and adequacy of housing space was positively associated with how respondents self-assessed their health.[88]

Urban area gardens and farms improve air quality. On the local level, plant foliage reduces carbon dioxide, ozone concentrations (heavy, low-lying gas), and lowers urban mass temperatures.[89] On a more macro scale, locally grown food reduces the present average of 1300

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[83] French SA, Wechsler H. 2004; Kien & Chiodo. 2003; Pranis 2003; Morris et al. 2002; Morris et al. 2001; Morris et al. 2000; Pothukuchi and Bickes 2001; Lineberger and Zajicek 2000; Predny and Relf 2000; Bellows 2004; Texas Department of Human Resources 1981. Some school-based research and program reports, *of the many*, National Gardening Association, http://www.nationalgardening.com/ and Kids Gardening Program, http://www.kidsgardening.com/; School Garden Research, KidsGardening.Com, http://www.kidsgardening.com/Dig/DigDetail.taf?ID=124&Type=faq; Edible School Yard Program. http://www.csg.org/CSG/Policy/education/school+health/edible+school+yard.htm.

[84] Brillinger et al. 2003; Farm-to-School Program, Community Food Security Coalition, http://foodsecurity.org/farm_to_school.html; Farm-to-College Program, Community Food Security Coalition, http://foodsecurity.org/farm_to_college.html.

[85] Edible School Yard Program, http://www.csg.org/CSG/Policy/education/school+health/edible+school+yard.htm.

[86] Armstrong-A 2000.

[87] Brogan and James 1980.

[88] Macintyre et al. 2003.

[89] Akbari et al. 1988; City of Toronto 1998; Heissler et al. 1995; Bernatzky 1983; EPA-NASA Urban Heat Island Project, http://www.ghcc.msfc.nasa.gov/uhipp/urban_uhipp.html.

miles that our food travels from "field to plate." Growing (and buying) locally is fuel efficient, less polluting, and has a relevant and substantial impact on our health.[90]

Urban gardens and farms increase urban bio-diversity. They attract beneficial soil microorganisms, insects, birds, reptiles, and animals. Gardens play a role in species preservation for birds and butterflies by providing food, resting spaces, and protection along migratory flight paths.[91]

Urban food production improves urban and urban fringe soils. Rooted plants stabilize the ground and reduce soil erosion. Cared-for soils absorb rainfall that then does not run over exposed, compacted dirt and pavement absorbing toxic debris and dumping it into storm drains. Urban compost systems can transform significant amounts of a city's waste (organic waste from yards, parks, food establishments, etc.) for beneficial re-use.[92]

IV. Community Health: Planning for Potential Health Risks

Heavy Metals

Many urban residents are challenged by soils containing toxic levels of heavy metals including lead, cadmium, mercury, nickel, and copper. The type of heavy metal depends on the source: paint, gas or oil, waste incineration, lead pipes, specific industries, etc. Dangers include direct absorption of toxics through ingestion (breathing and swallowing, the latter especially by children with their hands in their mouths) and indirect consumption through foods grown on the land that may have absorbed the toxics. Particularly in older cities, it is crucial to test soils for lead before growing food or even before allowing small children to enter and play in the garden spaces.

Appropriate gardening practices reduce risk. Strategies include: 1) improving soil stability through crop plantings and soil amendments like mulch, thereby reducing wind-born dust and the tracking of contaminated soils into residences by human feet and household pets; 2) emphasizing the cultivation of fruiting plants (including vegetables like peppers and eggplants) rather than green leafy vegetables and tubers because the latter absorb heavy metals about ten times faster than do fruiting plants; 3) adding compost and/or calcium to the soil to lower soil acidity and thus reducing the potential of metal "uptake" by plants; 4) growing ornamentals (for beaut

Air pollution
Polycyclic aromatic hydrocarbons (PAHs), a known carcinogen, have been found in urban soils. PAHs are residues from incomplete combustion. They may exist in gardens and other urban soils due to vehicle pollution from adjacent roads and railways, past wood or coal burning on or near the site, or the extensive use of creosote railroad ties as garden plot dividers during the 1970s & 80s. Little is known about them, but basic research has begun.[94]

Other Potential Risks
Other potential risks associated with urban gardening and farming require common sense strategies. Standing water can attract bugs, including mosquitoes carrying diseases like West Nile virus. Gardens and farms that rely on water catchment systems need to take simple precautions like covering standing water or seeking access to public water mains. Use of incompletely composted animal manures can spread diseases, however proper composting is simple to learn and implement. Standard and common sense safety measures are necessary with the use of heavy or sharp garden tools, especially around small children. Proper ergonomic use of tools lessens the risk of muscle strain. Reducing exposure from direct sunlight (hats, sun block, less gardening in the middle of the day) protects from sunburn and vulnerability to skin cancer.

Recommendations for Health Professionals

Health professionals can increase the positive benefits of urban agriculture in many ways. Here are a few suggestions:

- Cultivate a *Healing Garden* on idle land at your health department, medical office, hospital, or long-term care facility. The garden will provide serenity, food, and education about the therapeutic and preventative benefits of specific vegetables and of gardening.
- Encourage patients/clients to grow their own vegetables at home, as a therapeutic means for enhancing nutrition, physical exercise, and relaxation.
- Encourage patients/clients to shop at farmers' markets and/or join a vegetable-box subscription (sometimes called a Community Supported Agriculture, CSA) program to increase their access to fresh vegetables and fruits, and to support local farmers.
- Introduce the subject of public health and urban agriculture to your professional association to exchange ideas and find out what your colleagues know about the subject.
- Work with local planners and policy makers to establish new community gardens, preserve open space and market structures that secure urban food production in and near urban areas.
- Encourage State health departments to adopt the option of WIC redemptions at farmers markets and CSAs.
- Encourage local farmers markets and CSAs to incorporate mechanisms and support to accept emergency food assistance including food stamp benefits through EBT, and WIC and Senior FMNP coupons.

[94] Agency for Toxic Substances and Disease Registry, http://www.atsdr.cdc.gov/tfacts69.html

- Provide financial support for community-based gardening projects such as youth garden initiatives and community gardening.
- Support the national 'farm to school' movement.
- Envision and help to plan and implement a local farms-to-hospital program.
- Support a "Garden at every school" program like the successful model in California.
- Support 'edible buildings', green building' and 'vertical agriculture' programs.
- Join the Community Food Security Coalition to partner with the broad swath of active and engaged food and nutrition practitioners dedicated to building strong, sustainable, local and regional food systems that ensure access to affordable, nutritious, and culturally appropriate food for all people at all times.

For more information contact:
Community Food Security Coalition
PO Box 209
Venice CA 90294
www.foodsecurity.org
310-822-5410

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Bellows, Anne C. 2000. “Balancing Diverse Needs: Risks and Pleasures of Urban Agriculture in Silesia, Poland.” *TRIALOG: Zeitschrift fuer das Planen und Bauen in der Dritten Welt*. [J. for Planning and Construction in the Third World] Special issue on Urban Agriculture. June (Darmstadt, Germany). pp. 18-23.

Bellows, Anne C. 1999. "Urban Food, Health, and the Environments: The Case of Upper Silesia, Poland." Mustafa Koc, Rod MacRae, Luc J.A. Mougeot, Jennifer Welsh (eds.) *For Hunger-Proof Cities: Sustainable Urban Food Systems*. Toronto: International Development Research Centre (IDRC) and The Centre for Studies in Food Security, Ryerson Polytechnic University. pp. 131-135

Bellows, Anne C. 1996. “Where Kitchen and Laboratory Meet: The “Tested Food for Silesia” Program.” In Dianne Rocheleau, Barbara Thomas-Slayter, and Esther Wangari (eds.). *Feminist Political E*

Brown VM, Allen AC, Dwozan M, Mercer I, Warren K. 2004. “Indoor gardening older adults: effects on socialization, activities of daily living, and loneliness.” *J Gerontol Nurs*. 2004 Oct;30(10):34-42.

Caspersen, et al. 1991. "The prevalence of selected physical activities and their relation with coronary heart disease risk factors in elderly men: the Zutphen study, 1985." *American Journal*

Faber M, MA Phungula, SL Venter, MA Dhansay, and AJ Benade. 2002. "Home gardens focusing on the production of yellow and dark-green leafy vegetables increase the serum retinol concentrations of 2-5-y-old children in South Africa." *American Journal of Clinical Nutrition*. 76(5):1048-54, Nov.

Feenstra,G, S McGrew, and D Campbell. 1999. Entrepreneurial Community Gardens: Growing Food, Skills, Jobs, and Communities. University of California, Sustainable Agriculture and Research Program. Agricultural and Natural Resources Publication 21587. http://www.sarep.ucdavis.edu/pubs/entrepreneurial.htm.

Fisher, Andy. 1999. *Hot Peppers & Parking Lot Peaches: Evaluating Farmers' Markets In Low Income Communities.* Community Food Security Coalition http://www.foodsecurity.org/pubs.html#urban_ag.

Francis, M, P Lindsey, and JS Rice. 1994. The Healing Dimensions of People-Plant Relations: A Research Symposium. Center for Design Research, UC Davis, CA.

Fredrick, Jacqueline and Eva Holzer. 1980. *Nutrition Education Training Manual for Family Day Care Providers.* Trenton, NJ: New Jersey Nutrition Education and Training Program, State Department of Education and West Orange, NJ: Educational Improvement Center-Northeast.

French SA and Wechsler H. 2004. "School-based research and initiatives: fruit and vegetable environment, policy, and pricing workshop." *Prev Med.* 2004 Sep;39 Suppl 2:S101-7.

Giordano, Susan and Chick F. Tam, et al. 1998. "Growing in the city." *WE International*. Spring/Summer 48/49:p40-41.

Gradwell, Shelley et al. [no date] Community Supported Agriculture: Local Food Systems for Iowa. Report, Iowa State University Extension. http://www.extension.iastate.edu/Publications/PM1692.pdf.

Greenberg, Micheal and Dona Schneider. 1996. *Environmentally Devastated Neighborhoods: Perceptions, Realities, and Policies.* New Brunswick, NJ: Rutgers University Press.

Grimes DS, E Hindle, and T Dyer. 1996. "Sunlight, cholesterol and coronary heart disease. *QJM* 89(8):579-89, Aug.

Hackman RM and EL Wagner. 1990. "The senior gardening and nutrition project: development and transport of a dietary behavior change and health promotion program." *Journal of Nutrition Education.* 22(6):262-270. Nov-Dec.

Haines A, D Patterson, M Rayner, K Hyland. 1992. "Prevention of cardiovascular disease." *Occasional Paper - Royal College of General Practitioners*. (58):67-78, Dec.

Halweil, Brian. 2004. *Eat Here: Homegrown Pleasures in a Global Supermarket.* WW Norton & Co.

Hamel, Stephanie and Joseph Heckman. 2003. Lead Contaminated Soil: Minimizing Health Risks. Fact Sheet 336. Rutgers, the State University of New Jersey, Rutgers Cooperative Extension. http://www.rce.rutgers.edu/pubs/pdfs/fs336.pdf

Hamm, Michael W and Anne C Bellows 2003. "Community Food Security and Nutrition Educators." *Journal of* Nutrition Education and Behavior. 35(1):37-43.

Hanna, Autumn K and Pikai Oh. 2000. "Rethinking Urban Poverty: A Look at Community Gardens". *Bulletin of Science, Technology and Society*. 20(3): 207-216, June.

Hanna, Autumn 1999. Growing Food and Community Social Capital. Masters Thesis. Penn State University (Sociology and African-American Studies). http://www.geog.psu.edu/phila/hannaoh.html.

Heisler GM, RH Grant, S Grimmond and C Souch. 1995. "Urban forests – cooling our communities?, in C. Kollin and M. Barratt (eds.) *Proceedings of the 7th National Urban Forest Conference*. New York, Sept. 12-16. pp. 31-34.

Herbach, Geoff. 1998. "Harvesting the City: Community gardening in Greater Madison, Wisconsin." Madison Food System Project Working Paper Series MFSP-1998-01. 31 pages.

Hinrichs, C Clare and Thomas A. Lyson (eds.) Forthcoming. *Remaking the North American Food System.* Lebanon, NH: University Press of New England

Hoisington A., SN Butkus, S Garrett, K Beerman 2001. "Field gleaning as a tool for addressing food security at the local level: case study." *Journal of Nutrition Education*. 33(1):43-8, Jan-Feb.

Hunger Action Network of New York State. 2005. Community Supported Agriculture in New York State: Profiles exploring how New York's farmers are proving low-income families with healthy, fresh & nutritious fruits and vegetables. http://www.hungeractionnys.org/.

_____. 2004. Reaching Out: Community Supported Agriculture in New York State. http://www.hungeractionnys.org/.

Hurley, Dan. 2004. "On crime as science (a neighbor at a time)" *New York Times*. January 6, 2004.

Hynes, H Patricia. 1996. *A Patch of Eden: America's Inner-City Gardeners*. Chelsea White River Jct., VT: Green Publishing Company.

Irwin ML, McTiernan A, Bernstein L, Gilliland FD, Baumgartner R, Baumgartner K, and Ballard-Barbash R. 2004. "Physical activity levels among breast cancer survivors." *Med Sci Sports Exerc*. 2004 Sep;36(9):1484-91.

Jones, A 2002. “An environmental assessment of food supply chains: A case study on dessert apples.” *Environmental Management.* 30 (4): 560-576 OCT.

Kantor, LS 1998. *A Dietary Assessment of the U.S. Food Supply: Comparing Per Capita Food Consumption with Food Guide Pyramid Serving Recommendations.* AER-772. U.S. Department of Agriculture, Washington, DC: U.S. Government Printing Office.

Lemaitre RN, DS Siscovick, TE Raghunathan, S Weinmann, P Arbogast, and DY Lin. 1999. "Leisure-time physical activity and the risk of primary cardiac arrest." *Archives of Internal Medicine*. 159(7): 686-90, Apr 12.

Lepp, NW. 1981. *Effect of Heavy Metal Pollution on Plants. Effects of Trace Metals on Plant Function.* Volume 1. London, England: Applied Science Publishers.

Levine, Allen, Catherine M. Kotz and Blake A. Gosnell. 2003. Sugars and Fats: The Neurobiology of Preference. J. Nutr. 133:831S-834S, March

Lewis CA. 1991. "Effects of Plants and Gardening in Creating Interpersonal and Community Well-being." in Relf, D (ed.) 1991. The Role of Horticulture in Human Well-being and Social Development: A National Symposium. Portland OR: Timber Press. pp. 55-65.

Lineberger, Sarah E and Jayne M Zajicek. 2000. "School gardens: can a hands-on teaching tool affect students' attitudes and behaviors regarding fruit and vegetables?" *HortTechnology*. July-September 10(3):593-597.

Lin, Biing-Hwan, Elizabeth Frazao, and Katherine Ralston. 2005. Nutrition and Health Characteristics of Low-Income Populations. Economic Research Service, United States Agriculture Department. Agriculture Information Bul.73286 0 Td (e)Tj 5.2901 0 Td (c)Tj 5 (l)Tj 3.36643 0 Td (

Magnus K, A Matroos, and J Strackee. 1979. "Walking, cycling, or gardening, with or without seasonal interruption, in relation to acute coronary events." *American Journal of Epidemiology* 110(6):724-733. Dec.

Magnus K, A Matroos, and J Strackee. 1980. [The relationship between smoking, physical activity and coronary heart disease (project Zeist). II. Walking, bicycling and gardening]. [Dutch] *Nederlands Tijdschrift voor Geneeskunde.* 124(36):1484-9, Sep 6.

Mann, Peter. 2001. "Why Homeland Security Must Include Food Security". World Hunger Year (WHY) Commentary.
http://www.worldhungeryear.org/why_speaks/ws_load.asp?file=56&style=ws_table.

Martinez-Salgado H, GO Martinez-Andrade, J Contreras-Perez, G Saucedo-Arteaga, L Huerta-Perez, RI Ramos, J Ramirez-Centeno, LM Meneses-Diaz, and A Chavez-Villasana. 1993. [Experiences in community participation to promote nutritional education]. [Spanish] *Salud Publica de Mexico*. 35(6):673-81, Nov-Dec.

Matsuo E and PD Relf (eds.) 1995. *Horticulture in Human Life, Culture, and Environment, A National Symposium* (proceedings), Acta Horticulturae, IHC Proceedings Number 391.

Maxwell, Daniel, Carol Levine, and Joan Csete. 1998. "Does urban agriculture help prevent malnutrition? Evidence from Kampala." *Food Policy.* 28(5):411-424

McBey MA. 1985. "The therapeutic aspects of gardens and gardening: a aspect of total patient care." *Journal of Advanced Nursing*. 10(6):591-5. Nov.

McGinnis M. 1989. "Gardening as therapy for children with behavioral disorders." *Journal of Child & Adolescent Psychiatric & Mental Health Nursing*. 2(3)87-91, Jul-Sep.

McGuinn, C and PD Relf. 2001. "A profile of juvenile offenders in a vocational horticulture curriculum. *HortTechnology* 11(3):427-432.

McKay, T. Empty Spaces, Dangerous Places. *Plan Canada*. January-February 1998.

McNamara, PE, CK Ranney, LS Kantor, and SM Krebs-Smith. 1999. "The gap between food intakes and the Pyramid recommendations: measurement and food system ramifications." *Food Policy* 24:117-133.

Milligan C, A Gatrell, A Bingley. 2004. "'Cultivating health': therapeutic landscapes and older people in northern England." *Social Science & Medicine*. 58(9):1781-93, May.

Morgan, K, B Peterkin, SB Johnson, and Goungetas. 1985. "Food energy and nutrients per dollar's worth of food from available home food supplies." *Home Economics Research Journal.* 14:241-251.

Morris, Jennifer L, Marilyn Briggs and Sheri Zidenberg-Cherr. 2002. “Development and Evaluation of a Garden-Enhanced Nutrition Education Curriculum for Elementary Schoolchildren.” Journal of Child Nutrition & Management. 26(2).

Pilcher, Mike. 1992.

Reynolds LR and JW Anderson. 2004. “Practical office strategies for weight management of the obese diabetic individual.” *Endocrine Practice*. 10(2):153-9, Mar-Apr.

Roberts, Wayne. 2005. How bok choy can beat sprawl. *Now Magazine.* http://www.nowtoronto.com/issues/2005-02-17/news_story.php.

Rolland Y, V Lauwers-Cances, M Pahor, J Fillaux, H Grandjean, B Vellas. 2004. “Muscle strength in obese elderly women: effect of recreational physical activity in a cross-sectional study.” *American Journal of Clinical Nutrition*. 79(4):552-7, Apr.

Saldivar-Tanaka, Laura. 2002. Culturing Neighborhood Open Space, Civic Agriculture, and Community Development: The Case of Latino Community Gardens in New York City. Masters Thesis. Cornell University. 87 pages.

Salitin, Joel. 1996. *Pastured Poultry Profits*. Originally published by Buena Vista, VA: Good Earth Publications. Reissue edition, Swoope, VA: Polyface, Inc. July 1, 1996.

Sempik, Joe, Jo Aldridge, Professor Saul Becker and Tim Spurgeon (Thrive) and Consultants: John Feris, Carol Norman and Bill Silburn. 2002. Growing Together - Promoting Social Inclusion, Health and Well-being for
Vulnerable Adults through the use of Horticulture and Gardening. Report by CCFR and Thrive (formerly Society for Horticultural Therapy).
http://www.lboro.ac.uk/departments/ss/growingtogether/project/projectDescription.html.

Shewfelt, R L. 1990a. “Sources of variation in the nutrient content of agricultural commodities from the farm to consumer.” *J. Food Quality*, 13:37-54.

Shewfelt, RL. 1990b. Quality of Fruits and Vegetables. A Scientific Status Summary by the Institute of Food Technologists' Expert 5.796100148(0)Tj13.00574005740(0)Td(a)16(8)13(1)1(0)Td(p)6400148

Von Hassell, Malve. 2002. *The Struggle for Eden: Community Gardens in New York City.* Westport, CN: Bergin & Garvey.

Waliczek, Tina M, Richard H Mattson, and Jayne M Zajicek. 1996. “Benefits of community gardening on quality-of-life issues.” *Journal of Environmental Horticulture.* 14(4):204-209.

Wannamethee SG and AG Shaper. 2001. “Physical activity in the prevention of cardiovascular disease: an epidemiological perspective.” *Sports Medicine.* 31(2):101-14, Feb.

Wannamethee SG, AG Shaper and M Walker 2000. “Physical activity and mortality in older men with diagnosed coronary heart disease.” *Circulation.* 102(12):1358-63, Sep 19.

Wells, Betty and Shelly Gradwell. 2001. “Gender and resource management: community supported agriculture as caring-practice.” *Agriculture and Human Values* 18 (1): 107-119.

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Edible School Yard Program, http://www.csg.org/CSG/Policy/education/school+health/edible+school+yard.htm.

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Informed Eating: A Newsletter of food policy and analysis, http://www.informedeating.org/newsletters/040215.htm.

"Jersey Fresh" Program, http://www.state.nj.us/jerseyfresh/.

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New England LAND LINK, http://www.smallfarm.org/nell/nell.html.

"Plant-a-Row" Project, http://www.gardenwriters.org/par/.

Project on Human Development in Chicago Neighborhoods, http://www.hms.harvard.edu/chase/projects/chicago/index.html.

San Francisco Department of the Environment, Composting Page, http://temp.sfgov.org/sfenvironment/aboutus/recycling/compost.htm.

School Garden Research, KidsGardening.Com, http://www.kidsgardening.com/Dig/DigDetail.taf?ID=124&Type=faq.

THRIVE, Using Gardening to Change Lives, http://www.thrive.org.uk/.

Urban Biodiversity, Urban Ecology and Urban Sustainable Environment, Convention on Biodiversity, Belgian Clearing-House Mechanism, http://bch-cbd.naturalsciences.be/belgium/links/themes/urban.htm.

United Nations Food and Agriculture Organization. Urban and Periurban Agriculture on the Policy Agenda; Virtual Conference and Information Market, August 21-September 30, 2000, http://www.fao.org/urbanag/default.asp.

United States Department of Agriculture, Food Stamp Program, http://www.fns.usda.gov/fsp/.

United States Department of Agriculture, Food Stamp Program, EBT Farmers' Market Demonstration Project Update, http://www.fns.usda.gov/fsp/ebt/ebt_farmers_markstatus.htm.

United States Department of Agriculture, Women, Infants, and Children (WIC), http://www.fns.usda.gov/wic/.

United States Department of Agriculture, Women, Infants, and Children (WIC) Farmers' Market Nutrition Program (FMNP), http://www.fns.usda.gov/wic/FMNP/FMNPfaqs.htm.

World Hunger Year, Food Security Learning Center, http://www.worldhungeryear.org/fslc/.