

Green Products, Green Standards, and Green Purchasing

Resources, Guidance, and Action with an Emphasis on Green Cleaning

By Carmi Orenstein, M.P.H., *Ribbon* Editor and BCERF Assistant Director

Awareness continues to grow about the potential effects that many of the approximately 100,000 synthetic chemicals in commercial use may have on public and environmental health. From the consumer point of view, it is often overwhelming trying to make sense of labels and make "safe" choices. Those involved in purchasing, or procurement, on an institutional level may also be interested in making "greener" – i.e. more health- and environmentally-sensitive – purchases. Increasingly, they may be mandated to choose products and services that are safer for health and the environment.

Some might have the knowledge and ability to seek out information on the contents and potential hazards of individual products, such as cleaners, paints, floor finishes, etc., and make informed choices. But even for the well informed, this can be a formidable task. What kind of guidance is available for those decisions? One cannot assume that if it is on the shelf for sale, it is safe, or that the label will contain all that is known – or unknown – about potential health effects.

US Regulatory and Other Activity

The Toxic Substances Control Act (TSCA) was passed by the US Congress in 1976, and is the primary regulatory law regarding toxic substances. It gives the US Environmental Protection Agency (EPA) the power to study chemicals and to limit or ban their manufacture or use. (Thirty different federal acts and amendments establish EPA's authority to regulate chemicals.) However, the TSCA "grandfathered in" most of the 62,000 chemicals on the market before 1979, not subjecting them to the law's screening requirements. For those newer chemicals subject to screening, the criteria are limited. TSCA does not require manufacturers to develop new information before the chemical enters commerce, only to submit any information on impact on health and the environment that already exists; EPA needs to formally promulgate a rule on a chemical before new information is required. EPA has used its authority to require testing of less than 200 chemicals of those in commerce when TSCA began, and, under TSCA, has banned or limited production of only five chemicals or groups of chemicals: polychlorinated

biphenyls, fully halogenated chlorofluoroalkanes, dioxin, asbestos, and hexavalent chromium (GAO 07-825). (This does not include pesticides; EPA receives its authority to regulate pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Food, Drug, and Cosmetic Act.)

The Federal Hazardous Substances Act (FHSA) requires that household products containing hazardous substances be labeled with regard to potential health hazards, including directives on protective steps. The Consumer Product Safety Commission is charged with "protecting the public from unreasonable risks of serious injury or death from more

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than 15,000 types of consumer products under the agency's jurisdiction, including household chemicals" and "the FHSA gives the Commission authority to ban by regulation a hazardous substance if it determines that the product is so hazardous that the cautionary labeling required by the act is inadequate to protect the public." But very few substances are actually banned by the Commission and the Commission does not have the legal authority to test or certify products for safety before they can be sold to consumers. Warning labels must contain "signal words" ("DANGER" on substances which are extremely flammable, corrosive, or highly toxic, "WARNING" or "CAUTION" on all other hazardous substances) as well as "an affirmative statement of the principle hazard or hazards, such as 'flammable,' 'combustible,' 'vapor harmful,' 'causes burns,' or 'absorbed through skin,'" as well as precautionary and first aid measures and special statements for the protection of children if the product is intended for their use. Warning labels typically do not contain detailed information on chronic health effects or address chemicals for which regulatory activity and public health impact are still emerging or disputed, such as endocrine disruptors.

A variety of labeling regulations might cover a product that an institution may purchase. The Occupational Safety and Health Administration's Hazard Communication Standard applies to, for example, hazardous cleaning chemicals designed for institutional use, to which a worker may be exposed. This Standard requires worker training and the availability of the product's Material Safety Data Sheet (MSDS). MSDSs are designed to convey hazard information to all those "downstream customers," such as workers, management, physicians and emergency personnel. (See ► <http://www.OSHA.gov> and search "MSDS" for the MSDS Section of Hazard Communications Standard, 1910.1200[g]). MSDSs, prepared by the manufacturer, can also lack detailed information on chronic effects and effects for which definitive evidence is not available. OSHA is currently developing an enforcement initiative for its compliance officers to review and evaluate the adequacy of MSDSs.

For both consumer and institutional products, EPA labeling requirements apply when the product is a disinfectant or other type of pesticide. (In the case of pesticides, the word "label" has additional meanings regarding sale, use, and disposal, for manufacturers and enforcement agencies.) According to Cornell's Pesticide Management Education Program, for the user, a label provides "directions for correct and legal use to control a pest problem and ... valuable information to a

physician in case of a pesticide poisoning accident." EPA's labeling requirements include signal words that convey the pesticide product's relative acute toxicity: DANGER/POISON, WARNING, or CAUTION; a skull-and-crossbones symbol is required in association with a DANGER signal word if the ingredients are highly toxic orally, dermally, or through inhalation. Warning or precautionary statements are also required. (See ► http://pmep.cce.cornell.edu/facts-slides-self/pesticide_labels.html for a complete overview on pesticide labels.) A "Consumer Labeling Initiative," (CLI) conducted by EPA and governmental, industry, and other stakeholder partners, launched a "Read the Label First" campaign in 2000. The website says, "the CLI is a multi-phased pilot project focusing on indoor insecticides, outdoor pesticides, and household hard surface cleaners (i.e., floor and basin, tub and tile), some of which are registered antimicrobials/disinfectants" (► <http://www.epa.gov/opptintr/labeling/>).

There are also non-regulatory, non-certifying efforts emerging from the US federal government. The EPA's Design for the Environment (DfE) "Formulator" initiative offers a "unique approach to product review and formulation improvement," with a focus on cleaning products, with the possibility of carrying the DfE label. The DfE's Safer Detergents Stewardship Initiative recognizes companies who use safer surfactants, avoiding, for example, nonylphenol ethoxylates. EPA/DfE partners with several industry groups and Ecologo (see below) to provide CleanGredients™, its subscription online database of industrial and institutional cleaning product ingredient chemicals, "providing verified information about the environmental and human health attributes of listed ingredients." For a list of companies working with EPA's Design for the Environment Formulator Initiative program and the approximately 160 products eligible to use the DfE logo, see ► <http://www.epa.gov/dfe/pubs/projects/formulat/formpart.htm>.

Third-Party Certification: Focus on Green Seal

Where can one turn for focused guidance on selecting products that have been considered through a lens of rigorous health and environmental standards that address the entire life cycle of the product? We are seeing the establishment of third-party certifying organizations filling this role. Green Seal, the leading US organization working in this capacity, describes its mission as working "toward environmental sustainability by identifying and promoting environmentally responsible products, purchasing, and production." Similarly, EcoLogo

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(formerly known as Environmental Choice), founded by the Canadian government and also an independent certifying organization, provides “a tool to find, understand, and trust genuinely ‘green’ products.” Both are members of the Global Ecolabelling Network (GEN), Green Seal as the US representative and EcoLogo as the Canadian representative. GEN promotes third party green labeling internationally and helps its members work to

coordinate standards and certifications worldwide.

It is important to note the difference between labels that signify third-party certification and what the International Organization for Standardization (ISO) (the established and well-respected standards organization for commerce) calls, “informative environmental self-declaration claims.” In contrast, an “ecolabel,” is

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Recent book examines the European Union’s new approach on the regulation of chemicals

Schapiro, Mark (2007). *Exposed: The Toxic Chemistry of Everyday Products and What’s at Stake for American Power* (Chelsea Green Publishing).

The regulatory program of the European Union (EU), REACH (Registration, Evaluation and Authorisation of Chemicals), the author writes, “amounts to a revolution in how chemicals are managed, and in how production decisions around the world will be made from now on.”

Excerpts

Targeted chemicals: “The more than 60,000 compounds TSCA allowed to stay on the market without testing. Under REACH, these chemicals will have to be registered, evaluated for toxicity, and authorized before being permitted to remain in use.”

Expected impact: “According to their figures, REACH would prevent some 4,500 occupational cancer cases each year and reduce European healthcare costs from ailments related to chemical exposure by \$69 billion over the next three decades. Moreover, by establishing what will be the first open, actually free market in chemicals, in which informed consumers will be able to make decisions as to what risks they are willing to take, REACH promotes new research into the development of safer chemicals. Chemists have already come up with substitutes for some of the most problematic toxic chemicals on the market, and the EU estimates that its environmental initiatives have spawned billions of dollars in ‘green’ industries and technologies.”

Effect on US: “US companies could be put at a serious competitive disadvantage if they do not acknowledge the changes taking place across the Atlantic... Because American companies interested in exporting to the EU will also have to supply toxicity data to the European authorities, REACH does present opportunities for US consumers. Not only will these chemicals be subject to their first-ever health- and environmental-impact review but the findings will then be available on the European Chemical Agency’s website. At that point, US consumers may no longer choose to use untested American goods.”

For more information:

- <http://centerforinvestigativereporting.org/projects/exposed>
- <http://www.chelseagreen.com/2007/items/exposed>

See also United States Government Accountability Office (GAO) Report

GAO-07-825 Chemical Regulation: Comparison of U.S. and Recently Enacted European Union Approaches to Protect Against the Risks of Toxic Chemicals

- <http://www.gao.gov/new.items/d07825.pdf>

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awarded by an impartial third party in relation to certain products or services that are independently determined to meet environmental leadership criteria. As GEN explains on its website, ➤ <http://www.gen.gr.jp/>,

As businesses have come to recognize that environmental concerns may be translated into a market advantage for certain products and services, various environmental declarations/claims/labels have emerged on products and with respect to services in the marketplace (e.g. natural, recyclable, eco-friendly, low energy, recycled content, etc.). While these have attracted consumers looking for ways to reduce adverse environmental impacts through their purchasing choices, they have also led to some confusion and scepticism on the part of consumers.

Without guiding standards and investigation by an independent third party, consumers may not be certain that the companies' assertions guarantee that each labelled product or service is an environmentally preferable alternative. This concern with credibility and impartiality has led to the formation of both private and public organizations providing third-party labelling. In many instances, such labelling has taken the form of ecolabels awarded to products approved by an ecolabelling program operated at a national or regional (i.e. multi-countries) level.

What does the standard setting and certification process entail? Certifying organizations have developed their own procedures. According to Dr. Cheryl Baldwin, Green Seal's Vice President of Science and Standards (see box on opposite page), "Green Seal's leadership standards are based on a life-cycle evaluation and market assessment to identify the characteristics of an environmentally preferable product or service in the covered category. Green Seal uses an open and transparent process with input from all stakeholders, including industry and public interest groups; reasonable efforts are taken to achieve consensus." For certification, Green Seal evaluates products according to the life cycle criteria set in the standard. They conduct an on-site audit of the manufacturing facility to ensure the product production meets the standard, and certification is monitored annually to ensure that the products that carry the Green Seal mark continue to meet the standard.

Founded in 1989, Green Seal spent several years doing the groundwork for standard setting and certification

granting, completing its first certifications in 1992. The organization worked throughout the 1990s developing the environmental labeling standards of the ISO. Green Seal now has standards for over 40 major product categories, including household cleaners, hand cleaners, floor care products, paints and coatings, paper and newsprint, and fleet vehicle maintenance. (See ➤ <http://greenseal.org/certification/environmental.cfm> for a complete list of Green Seal Environmental Standards.)

What does a Green Seal Environmental Standard (GS) look like? GS-8 covers general-purpose, bathroom, glass, and carpet cleaners used for household purposes. As in any other category, Green Seal offers certification to any product in this category that complies with the Green Seal requirements. Requirements are designed "to reduce, to the extent technologically and economically feasible, the environmental impacts associated with the manufacture, use and disposal of products." In addition to explanations of the precise requirements for certification, a Green Seal standard includes background for understanding certification and accompanying concepts, and definitions for all products included in the standard's product category. *Note: the following list does not contain the Green Seal requirements in their entirety; please refer to the GS-8 document for all the standard's details.*

GS-8 product-specific health and environmental requirements prohibit:

- toxicity as defined by the Consumer Product Safety Commission;
- carcinogens, mutagens, and reproductive toxins;
- skin and eye irritant as tested using one or more peer-reviewed or standard test methods;
- skin sensitization as tested by one of several methods described;
- aquatic toxicity as determined by ISO or Organisation for Economic Co-operation and Development (OECD) criteria or if sufficient toxicity data exists for each of the product ingredients to show compliance;
- aquatic biodegradability in accordance with OECD;
- eutrophic agents (not more than 0.5% by weight of total phosphorus);
- air pollutants as determined by the California Air Resources Board Method 310;
- 2-Butoxyethanol, alkylphenol ethoxylates, phthalates, heavy metals, ozone-depleting compounds, optical brighteners;
- combustibility as tested by one of several methods described;
- fragrances not disclosed or not following the Code of Practice of the International Fragrance Association.

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Certification under GS-8 “results in products on the shelves in retail stores with low impact on aquatic life, minimized use of harmful substances, and increased health protection,” says Dr. Baldwin of Green Seal. “And,” she explains, “Green Seal is developing more standards for consumer products; for example, a standard for consumer soaps, cleansers, and shower products will be ready by the middle of 2008.” Other Green Seal certified products in retail stores include paints with low to no volatile organic compounds.

Aside from the setting of standards and the certifying process, Green Seal contributes to the greening of institutions in other ways. Green Seal provides assistance in purchasing, operations, and facilities management through product evaluations and recommendations, guidance manuals, partnerships, and special projects. Green Seal has an Institutional Greening Program, which has two new pilot projects, the Green Facilities Partnership and the Green Purchasing Partnership. “These programs,” Dr. Baldwin says, “provide recognition and offer hands-on technical assistance to organizations that are taking, or committing to take, significant actions to green their facilities management and/or purchasing. The partnerships require annual monitoring showing continuous improvement, provide for increasing levels of sustainability and recognition, are adaptable to a wide variety of organizations, and are designed to complement leading sustainability rating systems.”

From Networks to Mandates: Green Cleaning on an Institutional Scale

Procurement professionals themselves have joined together in efforts to promote green purchasing. The Responsible Purchasing Network (RPN) ➤ <http://www.responsiblepurchasing.org/> identifies “...best practices, developing effective purchasing tools, educating the market and utilizing its collective purchasing power to maximize environmental stewardship, protect human health and support local and global sustainability.” Their Purchasing Guide on cleaners provides guidance on developing specifications for green procurement policies, comparison charts for leading standards (Green Seal,

Cheryl Baldwin, Ph.D. is Green Seal's Vice President of Science and Standards. Dr. Baldwin earned her PhD here at Cornell. We asked her about earning her degree, her subsequent experience, and how it prepared her for her role at Green Seal.



My PhD is in Food Science with minors in Biochemistry and Nutrition. This work was on a zero-waste/closed-loop food system to be applied to space missions for NASA.

My focus was converting crop waste into usable resources for fermentation and production of healthy edible oils. From there, I worked in research and product development at a food manufacturer where I led health and wellness programs, including product commercialization. I also initiated a sustainability program focused on the life cycle impacts of the food products, including health and environmental considerations. Green Seal's standards are life cycle based and focus on products and services, thus my life cycle and product background has fit well into the leadership of the technical and standards programs at Green Seal.

EcoLogo, and Greenstar Certified) for green cleaning products, as well as lists of certified products. Purchasing Guides also cover price, performance, and availability of products.

Another organization of stakeholders, of which RPN is a part, is the Green Cleaning Network, ➤ <http://www.greencleaningnetwork.org>. It provides an important reminder that green cleaning is not just about selecting the right product. “A green cleaning program ... includes policies, procedures, training and shared responsibility; green cleaning programs are most successful when you have the input and commitment of ... building management, occupants, visitors and vendors. Communication is critical throughout the process so everyone understands how he or she contributes to the program's success.” The Green Cleaning Network offers an online discussion forum on its website, covering topics from tools and standards, to special issues for schools and hospitals, to legislation.

States and municipalities mandating green cleaning can play a leading role in influencing safer formulations of products due to their enormous buying power. The RPN says that state and local governments spend more than \$400 billion per year and colleges and universities

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more than \$300 billion. They highlight as model policies New York City's 2005 Green Cleaning Law, which entails a pilot green cleaning program and mandates the purchase of green cleaning and custodial products in city facilities by 2009, and New York State's Executive Order 134 and Statewide Law 2005 mandating the "procurement and use of environmentally sensitive cleaning and maintenance products for all public and nonpublic elementary schools" (more on New York State's Green Cleaning law below). Moreover, New York State is *funding* the revision of the nationally recognized green cleaning products standard, the Green Seal standard

for industrial and institutional cleaners, GS-37 (see box below). GS-37 certified products satisfy the requirements of the New York State law. Other municipal and state mandates also typically suggest or require the use of products certified by Green Seal and/or Environmental Choice to meet their requirements.

New York State's Green Cleaning Law

In 2005 New York State took a major step toward greening its government, as well as toward protecting children and those in school-based occupations, such as

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Revision Process Underway: Green Seal Environmental Standard for General-Purpose, Bathroom, Glass, and Carpet Cleaners Used for Industrial and Institutional Purposes

The revision of GS-37 started at the beginning of 2007. The funding to support the work on the revision of the standard has been primarily from the New York State's Office of General Services. A New York State representative is on the Executive Committee that manages and oversees the revision process. The State's only stipulation in funding the revision of GS-37 has been that it consider protection of children's health, since New York State uses GS-37 in its guideline for green cleaners in schools. The process for developing the revised standard is designed to provide open and equitable public and stakeholder access. The intent of the revision is to update it to ensure that it continues to be the leader in recognizing the most beneficial environmental and health characteristics of Industrial and Institutional cleaning products in the current and emerging market.

All the existing criteria of GS-37 are under review, but the key focus of review for this project has been the revision of the requirements to address new areas of health and environmental effects, such as asthmagens, asthma triggers, endocrine disruptors, mutagens, and neurotoxins, in order to protect vulnerable populations such as children.

The proposed revisions include specific chemical prohibitions as well as testing methods as a means to evaluate if a chemical has impacts of concern (e.g. biodegradability). When test methods are used as the means to evaluate if a chemical has impacts of concern, the method should be peer reviewed and a well-accepted, standard method. Endocrine disruptors are an area where standard methodology is not yet fully developed. Therefore, specific chemicals known to have endocrine disruptor activity have been proposed for prohibition.

The effort involves about 400 registered stakeholders and numerous technical experts in fields related to environmental science, air quality, and human health, particularly with respect to children's health. The proposed revisions were published in November of 2007 and were open for public comment until the end of January 2008. The comments received will be reviewed and the proposed revisions updated accordingly. It is anticipated that the final revised standard will be issued in June 2008.

Cheryl Baldwin, Ph.D., Vice President of Science and Standards, Green Seal, Inc.



school janitors and teachers, by requiring green cleaning in schools. In his testimony before the New York State Assembly in May 2006, Arthur Weissman, President and CEO of Green Seal, applauds New York State's leadership, having "pioneered in several areas of green procurement..."

The Healthy Schools Network, ➤ http://www.healthyschools.org/ny_program.html#2, was instrumental in the conceptualization and passage of the law, spending years on technical background work and grassroots efforts to gain support.

Many state agencies are involved in the development of guidance materials and specifications for carrying out the law: the Office of General Services (OGS), the Education Department (SED); the Department of Health (DOH); the Department of Environmental Conservation (DEC); and the Department of Labor (DOL). (For full information on the law, please see: ➤ <http://www.ogs.state.ny.us/bldgadmin/environmental/>)

What kind of progress is being seen in carrying out the law across New York State's elementary and secondary schools? The effective date of this law was September 1, 2006. However, the law stipulates that schools may continue to exhaust inventories of cleaning and maintenance products purchased prior to the effective date of the law. A report required of the SED as part of the law investigated the early progress of the transition. Released in June 2007, The New York State Environmentally Sensitive Cleaning and Maintenance Product Use in Schools Impact Survey Report "aimed to capture basic implementation and impact data, as well as to capture key information surrounding the performance, cost, and overall availability of environmentally sensitive cleaning and maintenance products. Furthermore, the survey was designed to collect information on whether policies exist which direct faculty, staff, and students not to bring their own cleaning products to school, whether custodial and maintenance staff receive training on the use of the environmentally sensitive cleaning and maintenance products, as well as information on the use of specific products – including antimicrobials and antibacterials."

The results of the survey demonstrate that levels of compliance differ between school districts and between individual schools within a district. As Stephen Boise, NYS Director of the Healthy Schools Network commented, "strict compliance with the

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Hand sanitizing lotions and wipes in schools

Within the context of carrying out the green cleaning law, questions on the use hand sanitizing lotions and wipes in schools come up frequently. Alcohol-based hand sanitizers (ABHSs) and alcohol-based hand wipes are not covered in the law, as they are not considered hand cleaning products. They are considered over-the-counter (OTC) drugs by the US Food and Drug Administration (FDA). The SED offered guidance in a May 2007 memo, including:

ABHSs are not cleaning products. Although a hand wipe may remove some soil, the ABHSs do not clean hands, rather they can sanitize the skin surfaces. Furthermore, soil on hands will actually reduce the effectiveness of ABHSs.

Proper hand washing (soap, warm water, and friction for 20-30 seconds) will remove 99% or more of harmful microorganisms from hands. Also, washing will remove soils and contaminants that are often found in soil, such as lead.

What about products with anti-microbial claims? New York State adopted an existing standard for hand cleaners and hand soaps that was jointly developed by Green Seal and Environmental Choice (GS-41/CCD-104). That standard is detailed in Appendix 5 of the OGS Guidelines and notes that the hand cleaner/hand soap product must "make no antibacterial, disinfecting, antiseptic or sanitizing product claims."

This standard was completed by Green Seal and Environmental Choice in June 2006. Only a few products were certified when the OGS Guidelines were adopted. Schools were advised that they could postpone purchasing certified products until after January 2007 when a list was expected to be available. Certified products are now available (➤ <http://www.ogs.state.ny.us/bldgadmin/environmental/ProductLists.html>), and schools should now purchase hand cleaners/soaps from that list for regular use in schools.

For full memo, see:

➤ http://www.emsc.nysed.gov/facplan/GreenCleaning/Green_Cleaning_update_050207.html

letter of the law needs work, but nearly all the schools to whom I have spoken are making a strong effort at compliance.” The report states that “the main goal of the legislation, to provide environmentally preferable cleaning products for use in schools that are available in the same form, function, and utility, as traditional products has largely been achieved.”


The majority of the schools had not exhausted their supply of products purchased before the legislation went into effect, so this survey was clearly a very early glimpse into schools’ continued transition to green cleaning. The report states that 310 surveys were received out of a total of 2,894 potential respondents, and that “the result of the survey may not capture the full impact of the bill in New York State Schools.” But as Stephen Boise says, “to me the glass is two-third full. We are working on getting complete compliance and looking to further improve the GS-37 standard.”

As all the major stakeholders involved in green purchasing note, there are many components to a successful transition to any green procurement program. The availability, affordability, and suitability of third-party certified products are crucial. But information sharing, and the training of and participation by all key players within the institution are also critical. Key recommendations from the Impact Survey Report include:

- Schools are encouraged to try different green cleaning and maintenance products until products are identified that best meet the needs of the schools. Schools that have successful green cleaning programs may be a source of insight on cleaning products and protocols that have been successful.
- OGS and SED are committed to more outreach to encourage schools to select environmentally preferable products in compliance with the law. Examples of appropriate outreach include encouraging the inclusion of training and education on green cleaning and maintenance products in required staff training in schools, and encouraging schools to provide information to persons in parental relation on how their child’s school is implementing the green cleaning requirements.

- Provide teachers, administrators, and custodial and maintenance staff and parents with opportunities to provide feedback to the school administration to comment on what products are working successfully, and where green products are not performing the required function. This information can be used to select alternate products to improve performance or allow individuals to advocate for better products to suit a particular need.

New York State, along with some other federal and state agencies and several municipalities across the US, is paving the way for practical, tested, large-scale green procurement programs. In his testimony before the New York State Assembly, Arthur Weissman of Green Seal urges the state, “to expand these achievements to many other important areas,” citing states that have instituted broad green procurement mandates, such as Massachusetts. He also cites the far weaker effect of programs that are voluntary. He cites New York State as a leader in green procurement that can help in “a concerted effort ... to provide for the filling of gaps,” such as the lack of standards in many categories.

A product being on the shelf at a store, or listed in a catalog of supplies, does not mean it is safe for human health or for the environment, at any stage in its life cycle. Fortunately there are third-party certifiers and agencies and institutions committed to lessening the impact of chemical products on public and environmental health. These organizations and efforts are making strides toward mitigating the effects of the tens of thousands of chemicals to which we are potentially exposed – at home, in public places, at school, and at work. 

REFERENCE

GAO-07-825 Chemical Regulation: Comparison of U.S. and Recently Enacted European Union Approaches to Protect Against the Risks of Toxic Chemicals

➤ <http://www.gao.gov/new.items/d07825.pdf>



This article can be found on our website at:

<http://envirocancer.cornell.edu/Newsletter/articles/v13green.cfm>

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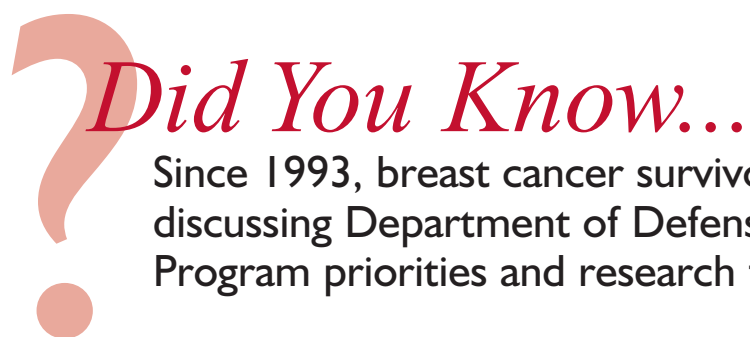
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Dr. Richard Stahlhut, University of Rochester
- **The Estrogen Connection: Estrogenic Chemicals in Plastics, Personal Care Products and Electronics**
Dr. Suzanne Snedeker, BCERF
- **The Rochester Healthy Home: A Model for Integrated Toxics Education**
(INCLUDING OPTIONAL FIELD TRIP FOLLOWING THE PROGRAM)
Dr. Katrina Korfmacher, University of Rochester

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Vitamin D and Cancer: Update from Cornell's Sprecher Institute for Comparative Cancer Research

By Rodney L. Page, *Alexander de Lahunta Chair*, Department of Clinical Sciences, Director, Sprecher Institute for Comparative Cancer Research and BCERF

Vitamin D can affect regulation of many cellular processes associated with cancer development and therapy, including differentiation, proliferation and apoptosis.

Vitamin D deficiency has been linked to increased incidence of certain cancers suggesting that supplementation with vitamin D may be beneficial. In addition, high-dose vitamin D has been demonstrated to enhance traditional chemotherapeutic activity. Several excellent reviews have recently been published (see below).

Investigators at Cornell's Sprecher Institute for Comparative Cancer Research have been involved with collaborators at Roswell Park Cancer Institute in several studies employing vitamin D in spontaneously occurring cancers in animals.

The woodchuck (groundhog) is one of the few animals, other than humans, that develop liver cancer following infection with hepatitis B virus. Worldwide, morbidity and mortality due to hepatitis virus-induced liver cancer in humans is profound. Previous studies in the woodchuck model have provided numerous insights into management of this disease. Vitamin D supplementation is currently being investigated to determine whether prevention of liver cancer might be possible. High dose vitamin D studies are also ongoing to assess the potential for therapy of existing

tumors. Preliminary trials have been focused on defining the metabolism of vitamin D in this model, general effects on cellular processes and how to supplement appropriately.

Pet dogs and cats that develop cancers are also being studied


Pet dogs and cats that develop cancers are also being studied as a means to determine the ability of vitamin D to improve chemotherapeutic activity.

as a means to determine the ability of vitamin D to improve chemotherapeutic activity. A dose-ranging study has been completed to ensure that high-dose vitamin D can be safely administered to canine cancer patients receiving chemotherapy for various forms of cancers and to confirm that blood concentrations of vitamin D can be achieved to potentially improve cancer response. A follow-up study is now being planned to determine whether improvement in cancer control can be achieved.

Surprisingly, one of the only spontaneous models for ovarian cancer occurs in the domestic chicken. Hens that survive beyond 2-3 years have an increasing incidence of ovarian cancer that is similar clinically to ovarian cancer in women. In some strains, 40-50% of

hens develop cancer of the ovary. This novel model is being characterized by scientists at Cornell with the intent of examining vitamin D supplementation and its effects on cancer development. (See also *The Ribbon*, Vol. 11, No. 2 for article "Using the Domestic Hen as a Model for Studying Ovarian Cancer.")

Whether vitamin D reduces cancer risk or improves cancer therapy cannot yet be confirmed but is being actively investigated at

many institutions. The work being conducted at Cornell utilizes unique, valuable models of human cancer to help clarify this subject. 

Recent review articles on Vitamin D

Holick, M. (2007). Vitamin D deficiency. *New Engl J Med* 357, 266-281.

Deeb, K.K., Trump, D.L., and Johnson, C.S. (2007). Vitamin D signalling pathways in cancer: potential for anticancer therapeutics. *Nat Rev Cancer* 7, 684-700.



This article can be found on our website at:

<http://envirocancer.cornell.edu/Newsletter/articles/vl3VitaminD.cfm>

New BCERF Fact Sheets Posted on the Web


<http://envirocancer.cornell.edu>

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#19 *Physical Activity and Breast Cancer Risk*
(revision of *Exercise and the Risk of Breast Cancer*)

#56 *Obesity and Breast Cancer Risk*

#57 *Obesity and Cancer Risk*



Program on Breast Cancer & Environmental Risk Factors
Fact Sheet #56 • August 2007

Obesity and Breast Cancer Risk

Obesity is well established as a risk factor for postmenopausal breast cancer. Studies of body mass index (BMI) and breast cancer risk have found that postmenopausal women whose BMI falls in the obese category have about twice the breast cancer risk of women with a BMI in the normal weight category. The relationship of obesity to breast cancer may be modified by several other risk factors including menopausal status, use of hormone therapy after menopause, drinking alcohol, age, genetics, and physical activity.


The connection between obesity and breast cancer risk is complex. The relationship of obesity to premenopausal breast cancer is less clear than that seen with postmenopausal breast cancer. This is to some extent because menopause has been related to a weak decrease in breast cancer risk while obesity after menopause has been related to an increase in postmenopausal breast cancer.

Other measures of body weight and the amount of body fat have been linked to an increase in the risk of postmenopausal breast cancer. These include excess weight gain during adulthood, adult weight, and distribution, and adult weight. While weight gained during adulthood has been consistently associated with increased risk of breast cancer, consistency has been reported for abdominal body fat and adult weight. On the whole, studies suggest that the characteristic linking obesity to postmenopausal breast cancer is the amount of body fat.

Obesity is an important breast cancer risk factor. It is one of the most common cancer risk factors that women can modify. Obesity contributes to the incidence of breast cancer in the United States, and it is associated with an increased risk of breast cancer.

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Funding for this fact sheet was provided by the USDA Cooperative State Research, Education and Extension Service.




Program on Breast Cancer & Environmental Risk Factors
Fact Sheet #19 • January 2008

Physical Activity and Breast Cancer Risk

Summary
A panel of expert scientists assembled by the World Cancer Research Fund and the American Institute for Cancer Research (WCRF/AICR) recently reviewed existing studies on the association of physical activity and breast cancer risk. The WCRF/AICR panel concluded that physical activity probably has a preventive effect on postmenopausal breast cancer. However, panel members found less evidence for a relationship between physical activity and premenopausal breast cancer, and they rated this association as being limited but suggestive. Studies examining physical activity and breast cancer risk have, on average, reported a 20 to 40 percent lower risk of breast cancer among women who are most physically active. Similar values have been reported for both pre- and postmenopausal breast cancer risk. These values are considered to represent a weak to moderate decrease in breast cancer risk. This finding is important because physical activity levels, unlike most breast cancer risk factors, can be changed. Over a lifetime each additional hour of physical activity per week, on average, has been linked with a six percent decrease in breast cancer risk.

Decreased breast cancer risk has been associated with increased physical activity in women of all but extremely high body sizes. This finding suggests that physical activity has benefits for breast cancer risk reduction beyond those associated with weight loss. There is also evidence that physical activity holds considerable promise for improving survival after a diagnosis of breast cancer. Other health benefits of physical activity include decreased risk of cardiovascular disease, stroke, diabetes, arthritis and other cancers.

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Program on Breast Cancer & Environmental Risk Factors
Fact Sheet #57 • November 2007

Obesity and Cancer Risk

Summary
Obesity has been associated with increased risk of a number of types of cancer. The risk of cancers of the colon and rectum, breast, body of the uterus (endometrium), kidney and esophagus have all been associated with obesity. Other cancers whose risk is likely to be related to obesity are cancers of the pancreas, liver, gall bladder and the cardia (uppermost region) of the stomach. The level of risk for most of these cancers is moderate, having relative risk values between 1.5 and 2.9. The contribution of obesity to the occurrence of cancer is considerable. In high income countries, such as the United States, obesity is considered to be the third largest contributor to cancer incidence behind smoking and alcohol use.

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Funding for this fact sheet was provided by the US Department of Agriculture Cooperative State Research, Education and Extension Service. Any findings, conclusions or recommendations are those of the authors and do not necessarily reflect the views of these agencies.

Preparation of these fact sheets is funded by a grant from the USDA Cooperative State Research, Education, and Extension Service.

The Ribbon is published by the Cornell Program on Breast Cancer and Environmental Risk Factors in New York State. Funding provided by the New York State Departments of Health and Environmental Conservation.

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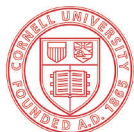
Design

West Hill Graphics,
Ithaca, NY



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