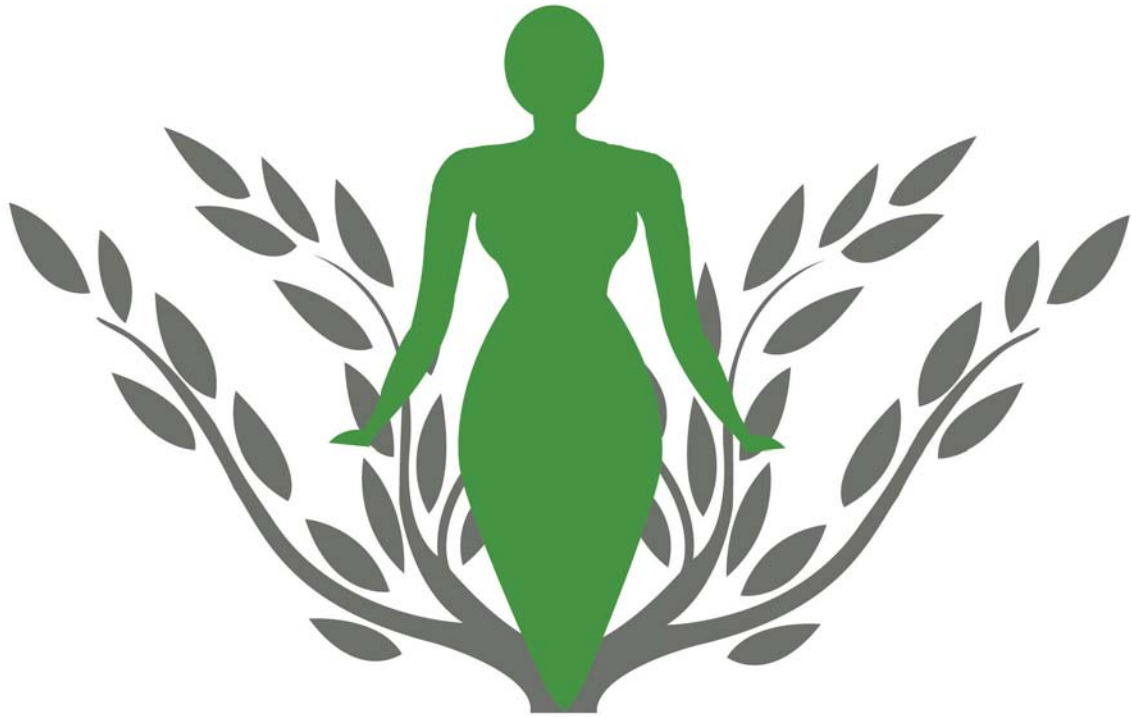


Obesity, Nutrition, and Environmental Health



Researching Women's Environmental Health 2010 Workshop Report



The 2010 Researching Women’s Environmental Health (RWEH) Workshop brought together researchers, doctors, community leaders, media, and policy-makers with a shared interest in obesity, nutrition, and environmental health. The agenda featured five dynamic and influential leaders who came from around the country to share their passion and work on issues of environmental health. Their goal was not only to share the latest research, but to talk more broadly about how science is understood and processed by the public. In this workshop report, we highlight take-home points from the speakers who talked about environmental health as well as lessons learned from the small group discussions that followed. We use these take-home points as a guide for how we, as scientists and educators, can improve our ability to communicate scientific messages.

RWEH 2010 Speakers

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Obesity and Environmental Chemicals: Dr. Jerrold Heindel, from the National Institute of Environmental Health Sciences, presented research suggesting that chemicals in the environment- known as ‘obesogens’- can actually disrupt metabolism and contribute to obesity.



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Diet and Epigenetic Changes: Dr. Dana Dolinoy, from the University of Michigan, presented her research on how exposing pregnant mice to environmental chemicals can affect the health of their babies. The babies have altered DNA and are at increased risk of obesity.



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Diet and Fertility: Dr. Jorge Chavarro, from the Harvard School of Public Health presented his research on nutritional factors that can affect human fertility. Did you know high fat dairy products can increase fertility?



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Increasing the Use of Local Foods: Chris Hartman, founder of Head-water Foods in Rochester, NY, discussed his efforts to educate young people about the value of locally grown, healthy foods, and how to mobilize Rochester Area Communities and farmers to improve the supply of locally grown foods.



The RWEH 2010 Audience



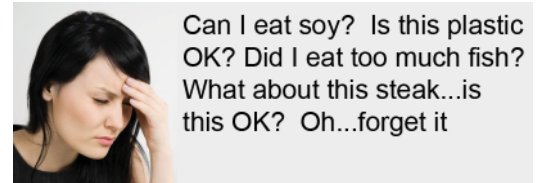
This year's workshop had 125 attendees from the Rochester community and beyond. The diverse audience included researchers, clinicians, community members, media, and policy makers with a shared interest in issues of nutrition, obesity, and environmental health. The focus of the event was chosen in response to surveys completed during the 2009 RWEH workshop.

An overview of what we learned at RWEH 2010

Although we all want to be healthy, motivating people to actually take action to improve their health can be a challenge. Some researchers believe that the best way to motivate action is to raise people's concern about health issues, like environmental health. For this reason, at RWEH 2010, we asked participants how concerned they were about the topics covered in the talks. What we found is that, while the participants said they were very concerned, they didn't think the community at large shared those concerns for a variety of reasons. While this might lead environmental health researchers to think that our community outreach activities should aim to raise people's concern, as we delved deeper into the issues, different issues emerged.

The problem:

Building concern on the topic of environmental chemicals can lead to apathy and a feeling of helplessness, and therefore...INACTION.



In analyzing the discussions, we found that raising the level of concern may actually backfire and make people feel disempowered, so what can we do to help people make better choices to reduce their exposure to environmental chemicals? In the discussion groups, it became clear that participants wanted to talk about improving nutrition, not just reducing exposure to chemicals in food. As it turns out, the two go hand in hand. Promoting healthy eating has the dual benefit of improving nutrition and reducing chemical exposures at the same time. Instead of explaining the many different environmental chemicals and the ways to avoid them, our results suggest that **focusing on healthy eating habits may be easiest way to improve people's health and reduce their chemical exposures.**

With that knowledge, where do we go next? The job of aligning easy-to-do recommendations for healthy eating with research on environmental chemical exposures isn't a simple task. It will take the combined efforts of researchers, health educators, physicians and consumers. In order to make these recommendations, we'll need to know about the sources of these chemicals, the dangers that they pose, and the public perception of these dangers. So if you're interested in communicating about environmental exposures, or if you just want to know more about obesogens, fertility, epigenetic changes or efforts to make eating local foods easier, read on!

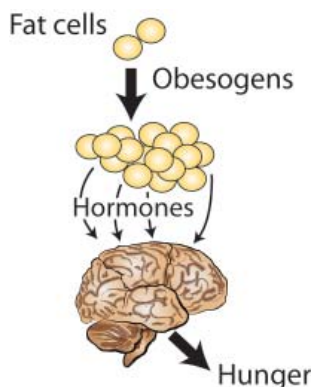


Obesity and environmental chemicals

We now know that reducing obesity is not as simple as eating less and exercising more. Although diet and exercise are still essential parts of the equation, evidence increasingly shows that what happens early in life, as a young child or even a fetus, can increase our risk for obesity later on. The combined effects of nutrition, stress, drugs, infections and exposures to environmental chemicals can “program” the way the body controls weight and metabolism. These changes can last a lifetime, even after the negative exposures are gone.



To prevent obesity, the focus needs to be not only on overeating and lack of exercise, but on early human development and reducing environmental exposures and improving nutrition at those key times.



Chemicals in the environmental may disrupt your body’s metabolism and weight control by interfering with hormone levels.

- **BPA**- found widely in processed food and food packaging (particularly cans), many plastic products, and some sales receipts
- **Phthalates**- also found widely in processed food and food packaging, beauty products and toiletries, and vinyl products (such as shower curtains or flooring)
- **Parabens**- commonly found in cosmetics and pharmaceuticals
- **Dioxins**- found in animal products, such as meats, dairy, and fish

What should we do about the problem?

Workshop participants were asked the question “What actions can be taken to reduce exposures that increase our susceptibility to obesity?” They were also asked to identify barriers to those actions, and how to overcome those obstacles. The discussion gives great insight into what the community would like to see done.

<u>Actions</u>	<u>Barriers</u>	<u>Solutions</u>
Educate young people and mothers about the dangers of environmental chemicals	Mothers have a lot to deal with already... we’re all oversaturated with information.	Make information easy to understand and actions easy to do. Learn about cultural myths that may work against your message (skinny women need to put some meat on their bones!)
Eat more unprocessed and organic foods	People don’t think it’s really worthwhile. It takes more time, money, and effort to eat this way.	Get the community involved in neighborhood gardens. Give healthy eating “celebrity status”
Regulate product contents and labeling	This might be “too much government” We’d have to change our attitude about chemicals from “Safe till proven otherwise” to “not until it’s proven safe.”	Get people together to advocate for safer products, support responsible businesses, and ask for policy changes. Start with your local government and let the process “trickle up.”

Take Home Points

Because the study of obesogens is in its infancy, it's premature to connect the dots from well-established scientific facts to specific recommendations to improve health. At this point, there are few clear-cut answers and there's a danger in communicating research findings too broadly so early in the game. Participants expressed that information that is overwhelming, or delivered in early studies that are later contradicted, lead to a general sense of apathy about health information and uncertainty about how individuals should respond (remember how eggs were bad for us?).



“First eggs are bad, then they’re good, then they’re bad, then the yolks are bad but the whites are good MAKE UP YOUR MIND, IT’S BREAKFAST, I HAVE TO EAT.”

Lewis Black, reading from *Nothing’s Sacred*

We are constantly learning more about chemicals and health, which can be exciting. At the same time, it can lead to mixed messages when studies seem to contradict one another. The consumer is left not knowing what to believe. Luckily, there are certain healthy behaviors that make sense regardless of what the “latest” new research says.



Eating fresh foods, like the ones on the left, is better for your heart, your waistline...and also for reducing exposures to phthalates.



Chemicals in our food products aren't going to go away soon. While there was a lot of desire in the discussion for regulation and labeling of products, the speaker pointed out that chemical research was not yet at the point where all chemicals had been identified or properly tested for safety. Even when we know how a chemical acts on its own, it doesn't tell us how it will act in a mixture with other chemicals. For this reason, **individual choices may be the most immediate way that people can protect themselves from environmental chemicals.**



What the health “message” could look like

Go to any website on BPA and you'll find out that it's in plastics, canned foods, frozen foods, soda cans, water bottles, baby bottles...wait! Information overload! If we apply what we've learned from the discussion groups, our recommendations for adults to avoid BPA would look like this:

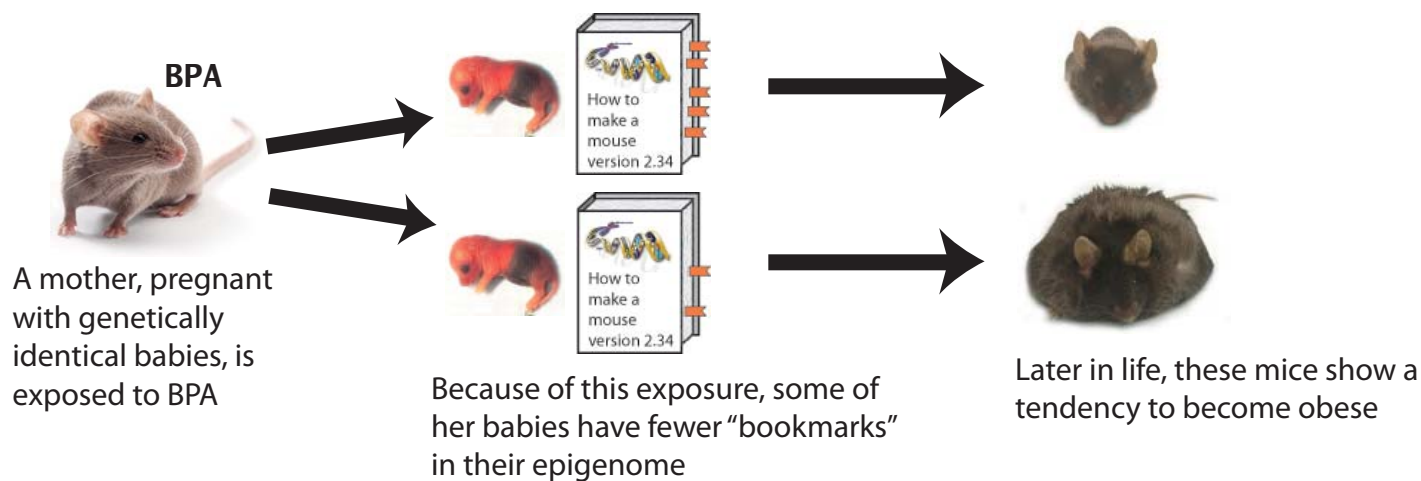
Eat fresh foods -- The less processed and packaged, the better.

But the plastics! The cans! The packaging! It's almost agonizing to ignore all the things that could be done to protect people from BPA, but for many people, eating fresh foods is hard enough. Perhaps environmental health educators could identify what one or two actions that would result in a multitude of health benefits and focus our efforts on making those things happen.



Diet and Epigenetic Changes

Your genome is all of your DNA. It's like a book of recipes for everything in your body. Sometimes these "recipes" (genes) get bookmarked to tell you which recipes you should be making. The whole set of "bookmarks" on your genes is called the epigenome. Environmental chemicals, like BPA, can not only affect your DNA (the content of the recipes) but also the epigenome, altering what molecular recipes are being made. When this happens, your risk for diseases like obesity may change. Want to know more? Check out the Tale of Two Mice, as told by Dr. Dana Dolinoy (For the audio slideshow at <http://www.pbs.org/wgbh/nova/body/>)



While this research was performed in mice, and exactly how similar the process is to humans unknown, it does raise concerns that environmental exposures during pregnancy may have long lasting consequences in adulthood.

What should we do about the problem?

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Actions	Barriers	Solutions
Get information about the dangers of chemicals in food out to the public in lay language	Even if the info exists, it doesn't penetrate into the public consciousness because people don't like to make changes.	Do community education that is interactive, gets children involved to form habits at an early age, and is respectful of a community's history and culture.
	Foods and products that contain fewer chemicals are not as widely available and can cost more.	Support policies for local farmers that subsidize "Specialty crops" like broccoli and lettuce.
Create built-environments that have less exposure to chemicals.	Our current environment would have to change significantly and people may not be ready for that.	Create policy that provides financial incentives for new buildings and retrofitting.
	"Safe" building materials cost more and are less available.	Do a long-term cost analysis to find the "True cost" of safe environments, including effects on health care costs.

Take Home Points

Although Dr. Dolinoy's work has implications for human health, the actual effects of chemicals like BPA on human health is not yet clear. It may be that the amount of BPA the average person is exposed to does not affect her health or the health of her children. Or it may be that it does. In the face of research findings that do not yet definitively tell us what the human risks are, researchers should be aware of how presenting their findings might affect their audience.

As one media expert pointed out "We're not yet at a place where we can make recommendations to people about what we should or should not do based on the research." While this is true, it is human nature to want to know what to do in the face of a potential threat. One participant pointed out that "not knowing" whether something was good or bad was overwhelming as well. So what is a researcher or health educator to do when engaging with the community on issues like this one?

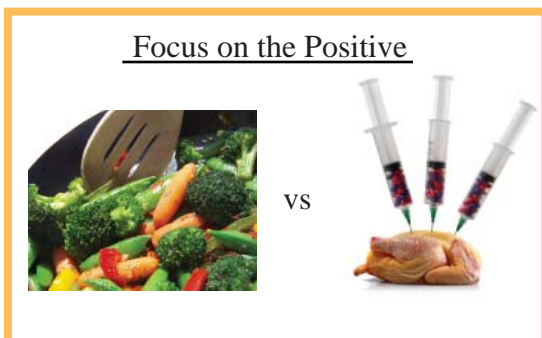


One possible answer to this question arose from observing that, during the discussions, healthy eating seems to be an issue of concern on people's minds. Researchers who are asked "What can I do?" by community members, might consider focusing their answer on healthy eating. Not necessarily because they are convinced that eating certain foods will reverse the effects of chemicals like BPA (which has been shown in mice, but not humans) but because foods like leafy vegetables, peas, beans, and fortified breads and cereals are well known to be part of healthy diet. Healthy eating may not be the scientifically proven answer to the effects of environmental chemicals on epigenomics, but it can't hurt, and will definitely help one's overall health. And, you can take advantage of high profile celebrities who make healthy eating their platform.



What the health "message" could look like

The most basic answer is to get out there and talk to people. Talk to community leaders. Talk to the media. Only by informing the public about the findings and their implications for human health can we start to create lasting changes. ...however, when it comes to advising people on those individual choices, based on what we learned at RWEH 2010, instead of saying, "BPA is in X, Y, and Z, and you can avoid it by doing 1, 2, and 3", you might say:

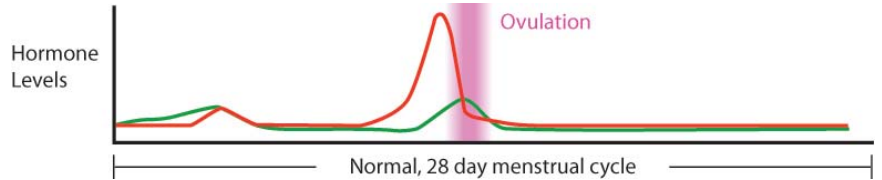


Eat fresh foods -- The less processed and packaged, the better. It's well known to be good for you in a variety of ways, and you'll avoid many common environmental chemicals found in food.

Diet and Fertility



This talk focused, not on the environmental chemicals in food, but on the properties of food itself. In his talk, Dr. Chavarro gave evidence that when women have trouble getting pregnant due to failure of the eggs to mature or be released from the ovaries, diet could improve the problem. It's important to note that this applies to women having trouble getting pregnant due to problems ovulating, not to women having trouble getting pregnant because there's a physical problem, such as blocked fallopian tubes.



Dr. Chavarro's research team studied a group of seventeen thousand women over the course of eight years as they tried to become pregnant. They looked at the diets of the women in detail and recorded cases of infertility during the eight years. What they found was that women who ate a better diet (more vegetable protein, vitamins, and monosaturated fats) had fewer cases of infertility. While Dr. Chavarro's research team feels that additional studies should be done to confirm these findings, this is some of the first scientific evidence that diet can directly affect one's ability to get pregnant.



What should we do about the problem?

Workshop participants were asked the question "What actions can be taken to reduce exposures that increase our susceptibility to obesity?" They were also asked to identify barriers to those actions, and how to overcome those obstacles. The discussion gives great insight into what the community would like to see done.

Actions	Barriers	Solutions
Improve access to healthy foods, and the knowledge and materials it takes to prepare them.	The economic structure of the food industry makes corn-based products (which tend to be less healthy) cheaper than "specialty crops" like green vegetables. There's a lack of education as to what to do with fresh foods.	Support farm bills that increase subsidies to specialty crops to counteract lobbyists. Provide education to families receiving aid. Encourage grocery stores to follow the lead of Wegman's in providing education in the preparation of foods in their produce sections.
	There is limited access to fresh produce.	Support programs that bring fresh produce to "food deserts" where such foods are not available. Look into the NYC green cart program as a model.

Take Home Points

We've already talked about how one way to improve environmental health is to do so indirectly - by focusing on good nutrition as a key behavioral change, health educators might reduce environmental exposures without overwhelming audiences with information about chemical toxins or making them feel helpless because toxins are unavoidable. In Dr. Chavarro's talk, we were given another compelling reason to stress good nutrition as a key to good health. But is using fertility as a focal point a good idea? The resounding message from our participants was that

fertility is not a public health issue, but a personal health issue. For most people, improving fertility through diet was an added benefit of healthy eating, but not the main motivation to change behaviors. One partici-



participant voiced her unease that the discussion might focus only on how nutrition was related to fertility, as she felt that the effect of nutrition on pregnancy and childhood was much more important. For that reason, the actions you see in the blue section on the previous page are about nutrition in general, not nutrition and fertility specifically. As one participant mentioned, increasing control over fertility through healthy eating is merely an added benefit, and should not be the real focus of changing eating behaviors.

That said, increasing numbers of women are struggling with fertility issues and for that growing group, improving fertility could act as a very strong motivator for a lifetime of lifestyle changes. As Dr. Chavarro points out, even a five percent change in body weight can result in immediate improvements in fertility. Food for thought for educators when they're thinking about who they might target to make effective changes in healthy eating behaviors. Could the resources used to educate women trying to get pregnant about healthy eating have more long lasting consequences than trying to change someone's eating habits at any other time?

What the health "message" could look like

Dr Chavarro's research gives women ten steps for improving fertility:

- Avoid trans fats (in fast foods and pre-prepared foods) and foods with "partially hydrogenated" anything.
- Cut back on saturated fat from red meat. Go for unsaturated oils like olive and canola.
- Eat less animal protein and more vegetable protein, such as beans and nuts.
- Choose whole grains over highly refined carbohydrates.
- Temporarily go for full-fat dairy products - one glass of whole milk or one serving of full-fat yogurt or ice cream daily.
- Take a multivitamin that contains folic acid and other B vitamins.
- Get plenty of iron from fruits, vegetables, beans and supplements, not from red meat.
- Drink water; have coffee, tea and alcohol in moderation. Avoid sugared sodas.
- If you are overweight, lose between 5 percent and 10 percent of your weight.
- If you aren't physically active, start a daily exercise plan; if you're quite lean, don't overdo exercise.

These ten recommendations are just as valuable after a woman has become pregnant, and even when considering feeding her child. From an environmental health perspective, avoiding prepared foods reduces exposure to chemicals like phthalates, eating less saturated fats from meat and animal protein in general reduces exposure to many chemicals that are stored in fat. As Dr. Chavarro pointed out, these steps may help, and they certainly can't hurt -- and that's true for more than just fertility.

Increasing the Use of Local Foods



From a health perspective, Mr. Hartman’s focus on local foods has to do with creating access to healthy, nutrient dense, chemical free foods. But the use of local foods doesn’t just have an impact on individual health. As Mr. Hartman pointed out, social health, economic health, and ecological health are also impacted by his work.

By bringing communities and farmers together in a farmer’s market setting, Mr. Hartman’s projects build social capital. The relationships that are formed when these groups meet, trade and share contribute to a stronger community. There is evidence that groups that have strong social capital benefit from lower crime, better health, and better economic growth. Certainly, as Mr. Hartman points out, building a model by which foods are provided by local farmers and industries keeps money and jobs in local communities, thus building on the local economy. From an ecological perspective, transporting lettuce from California to New York represents a source of pollution that Mr. Hartman would argue is not necessary. Pollution not only affects the environment, but human health as well.



The take home message? Mr. Hartman put it succinctly: “I want people to think about food, toxins AND the larger context with social, economic and ecological components. These are the “whys” in terms of thinking about local and sustainable.”

What do you want to see done?

Workshop participants were asked the question “What actions can be taken to reduce exposures that increase our susceptibility to obesity?” They were also asked to identify barriers to those actions, and how to overcome those obstacles. The discussion gives great insight into what the community would like to see done.

Actions	Barriers	Solutions
<p>Raise awareness about the benefits of eating fresh, healthy foods.</p>	<p>Eating healthy takes time.</p> <p>Unhealthy fast foods come with a lot of marketing and advertising dollars that fresh foods don’t have (toys for kids, etc).</p>	<p>Request that your grocery stores carry easy to prepare fresh foods (A bag of vegetables with easy prep instructions).</p> <p>Educate medical professionals to be proponents of fresh foods.</p> <p>Seek out pop-culture icons who are advocates of healthy eating and enlist them in public service announcements.</p>
<p>Make healthy foods (like fresh produce) cost less and easier to get a hold of.</p>	<p>Good food costs money to grow and harvest, especially in cold weather climates like Rochester.</p>	<p>Educate yourself on the farm bill and how subsidies affects the costs of “specialty crops” like broccoli versus corn and wheat. Then let your voice be heard on the issue.</p>
<p>Encourage school cafeterias to use local foods</p>	<p>Schools have to use food vendors that are approved by state contracts.</p> <p>There seems to be a lack of participation by dieticians when it comes to planning meals by some schools</p>	<p>People who have an interest in seeing schools use more local food sources need to speak up in front of their school boards and parent/teacher associations about both these issues.</p>

Take Home Points

We've talked about streamlining complex messages about avoiding environmental toxins into a single, simpler one that concentrates on healthy eating. But beyond simplifying the message about environmental toxins is the discussion on how to make healthy eating an easy and viable option for people. While many participants were already dedicated to healthy eating and local food use, they brought up a number of reasons why other people in the community might not be, including access, expense and time. Any successful environmental health initiative will need to address these concerns. There are no easily identifiable, and community accessible directives for healthy or local eating that demonstrate how easy or affordable it could be for people in different locations. This type of practical advice is important to locate or create in order to promote healthy eating as an action for improving environmental health.



What the health “message” could look like

In our previous sections, we've pointed out that making healthy eating a goal might be a good way to simplify the message on reducing environmental exposures. However, we've stopped short of describing how we can make healthy eating easier. Mr. Hartman's venture into delivery of local foods was a method of counteracting the common responses of “it's too hard and too expensive to eat local.” Health educators can't deliver food or make it cheaper, but might use the tool below to convince people that eating fresh and local is a viable and not so difficult option. For example, compare a box of frozen vegetables to a serving of locally grown vegetables. What are the real differences in cost per serving, preparation time, and nutritional value?

	Document what people are currently eating	Document a similar menu that contains more fresh and local foods
Cost		
Preparation time		
Locations to purchase		
Nutritional value		
Health benefits and dangers		
Environmental health exposures		



Researching Women's Environmental Health

This report summarizes four of the five talks given at the 2010 Researching Women's Environmental Health Workshop, held at the University of Rochester Medical Center (URMC) on Wednesday, September 15, 2010. The event was directed by Dr. Shanna Swan (URMC Departments of Obstetrics and Gynecology and Environmental Medicine) and Dr. Emily Barrett (URMC Department of Obstetrics and Gynecology).

This report was written by Dr. Shaw-Ree Chen and Dr. Emily Barrett. For more information on public education in Rochester on endocrine disruptors and other environmental chemicals, please contact Dr. Chen at shawree_chen@urmc.rochester.edu. For more information about the Researching Women's Environmental Health Conferences, please contact Dr. Barrett at emily_barrett@urmc.rochester.edu.

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