

# Center for Research on Occupational and Environmental Toxicology



Winter sunrise over the Willamette Valley. The shadow of the Three Sisters is reflected off the bottoms of the clouds. Photo by Fred Berman.

## NEWSLETTER

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### **CROET AND OR OSHA ISSUE ALERTS REGARDING FORMALDEHYDE IN A POPULAR SALON PRODUCT**

A stylist at a Portland area hair salon contacted CROET because she was experiencing nose bleeds, eye irritation, and difficulty breathing when applying a popular hair care product to her clients. The product, named Brazilian Blow-out Solution, is a hair smoother that is applied directly to the client's hair, which is then blow-dried and heated with flat irons. The salon discontinued its use of the product due to the symptoms the stylist experienced.

CROET industrial hygienist Dede Montgomery was asked to evaluate the issue. She examined the material safety data sheet (MSDS) accompanying the product, but found that it did not list any hazardous ingredients or impurities. The MSDS did not identify any respiratory hazards or precautions, nor did the container list any chemical ingredients.

Dede requested consultative services from Oregon OSHA. She took the original container to Oregon OSHA where an industrial hygiene consultant took a sample of the contents using standard sampling protocols. Oregon OSHA's accredited analytical laboratory found that the product contained 4.8 percent formaldehyde by weight. A product with this high a concentration of formaldehyde is legally required



OREGON  
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to have a hazardous substance warning in the MSDS that ships with the product.

### **CROET and Oregon OSHA Issue Alerts**

CROET immediately placed a notice on its “emerging issues and alerts” web page because of Oregon OSHA’s formaldehyde reports and the lack of information regarding the hazards of the product. As a result of this and later postings, CROET has received hundreds of phone calls and emails from stylists from across Oregon and the US who are concerned about the use of this product or who have experienced the same adverse effects.

Two years ago, the manufacturer of Brazilian Blowout began marketing a “formaldehyde free” product, named the Acai Professional Smoothing Solution, after an industry report revealed formaldehyde in their product. Before recommending the new, apparently reformulated product to the salon as a solution to the problem, Dede obtained a sample of the newer product from a different salon. Again, the original bottle was delivered to an Oregon OSHA industrial hygiene consultant, who again took a sample and the Oregon OSHA laboratory analyzed the sample. This time they used five different test methods, four quantitative and one non-quantitative. The four quantitative analyses concluded that formaldehyde was present well above regulated levels, at 10.6, 6.3, 10.6 and 10.4 percent by weight, respectively.

### **CROET Places Second Alert**

CROET posted a second advisory on its website to describe the newer product’s prominent label declaration and marketing of the product as “formaldehyde free”. Oregon OSHA also began an enforcement initiative allowing it to obtain directly from Oregon salons a significant number of additional product samples, including products from other manufacturers. A total of 105 samples of various hair-smoothing products were taken from 54 Oregon salons. Of these, 37 samples came from bottles of the Brazilian Blowout Acai Professional Smoothing Solution, labeled “formaldehyde free.” The formaldehyde content of these samples ranged from 6.8 percent to 11.8 percent and averaged more than 8 percent. An additional 19 of the samples were of Brazilian Blowout Solution (not labeled “formaldehyde free”, but also without mention of formaldehyde on its packaging or material safety data sheet). The formaldehyde content of these samples ranged from 6.4 to 10.8 percent and averaged approximately 8 percent. In addition to the Brazilian Blowout products, a limited number of samples were taken of several other brands of hair smoothing product. With two exceptions, all the other products tested at less than 2.5 percent formaldehyde, although several

of them were above the 0.1 percent threshold of the OSHA Formaldehyde Standard (for information on this standard, see <http://www.osha.gov/SLTC/formaldehyde>). Products above 0.1 percent are required to list formaldehyde in the MSDS that must accompany any product container.

Oregon OSHA also conducted air monitoring during treatments using the Brazilian Blowout smoothing product at seven different salons where a single treatment was conducted over the course of the day. The average exposures during an 8-hour day ranged from a low of 0.006 parts per million (ppm) to 0.33 ppm. These compare to a permissible exposure limit of 0.75 ppm. Although it was not exceeded for any of these stylists, it should be noted that multiple treatments occurring in the same room would significantly increase the daily average exposure. The federal OSHA law also has a “short-term” limit, which is the maximum exposure allowed at any time during a workday. This short-term limit is 2.0 ppm. During its air monitoring, Oregon OSHA also found short-term exposures ranging from a high of 0.11 ppm for one stylist to a high of 1.88 ppm for another. The 2.0 ppm limit was not exceeded, although the highest short-term exposure of 1.88 ppm represents 94 percent of the short-term limit.

It is important to note that the federal exposure limits have not been changed since 1984. The recommended exposure limits of both the American Conference of Government Industrial Hygienists (ACGIH) and the National Institute for Occupational Safety and Health (NIOSH) are much more protective (i.e., lower) than the regulatory levels adopted by OSHA in 1984. Almost all the sample results in the Oregon salons exceeded both the ACGIH and NIOSH recommended levels. Although the ACGIH and NIOSH standards do not carry the weight of law, most industrial hygienists recommend using these more protective standards for their employees.

### **Signs, Symptoms and Effects of Formaldehyde Exposure**

The irritant effects of formaldehyde are well documented. They include eye, nose and throat irritation; loss of sense of smell; increased upper respiratory disease; dry and sore throats; respiratory tract irritation; cough; chest pain; shortness of breath and wheezing. NIOSH cites many reports of primary skin irritation and allergic dermatitis as a result of skin contact with water solutions of formaldehyde. Both the Environmental Protection Agency and the federal Occupational Safety and Health Administration (OSHA) classify formaldehyde as a suspected human carcinogen because



## **“SAFE WORKPLACE, SAFE HOME”**

### **Pesticide Safety Training**

There are a number of things people can do to lower their levels of pesticide exposure. And, over the past several years, CROET Drs. Diane Rohlman and Kent Anger have been conducting training effectiveness research in agricultural, as well as other work sectors, to improve safety in the workplace. As part of an ongoing research study concerning agricultural pesticide exposure and child development, a project being conducted jointly by Pacific Northwest Agricultural Safety and Health and Oregon Health and Science

Hood River County Fair-goers participate in pesticide safety training research being conducted jointly by CROET and Pacific Northwest Agricultural Safety and Health.



University, OHSU researchers created a training venue at the Hood River County Fair in late July of this year. Using computer based training methods that have been proven effective in other aspects of agricultural work, such as orchard ladder safety; they developed and conducted a pesticide safety training called “Safe Workplace, Safe Home/ Sitio de Trabajo Seguro, Hogar Seguro”. The primary goal



CROET Research Assistant Tara Moomey explains Safe Workplace, Safe Home pesticide safety training to Hood River County Fair study participants.

of this training was to educate an agricultural community about safety issues connected to prolonged or chronic exposure to both agricultural and domestic use pesticides. In addition to the training fairgoers could stop by and play “Pesticide Safety Jeopardy” for prizes. There were also agricultural safety brochures and comic books for kids, provided in both English and Spanish. The group, numbering about 470 individuals, consisted of current agricultural workers, former agricultural workers, and members of the community who do not work in agriculture. The training was provided in both English and Spanish – a written section coupled with audio – to reach a wide range of educational levels. Participants were compensated for

their time in completing the training and the information was well received overall. Comparing pre- and post-test scores, the researchers were able to see improvement in the majority of participants who undertook the training.

### **OCHE Receives 2010 CROET Oregon Occupational Health Nurses Award**

The 2010 CROET Annual Oregon Occupational Health Nurses Worksite Award was presented to the Oregon Coalition of Healthcare Ergonomics (OCHE). Lynda Enos accepted the award on behalf of OCHE at the September 23, 2010 meeting of the Oregon State Association of Occupational Health Nurses. The awarded project will promote and disseminate injury prevention information to Oregon health care workers by supporting an ongoing project developing



Lynda Enos (L) accepts 2010 CROET Oregon Occupational Health Nurses Award from Dede Montgomery.

a first of its kind website to provide current information about health care ergonomics to health care safety and ergonomics professionals, providers, organizations, employees and consumers. The \$1500 worksite award will also be used to market and evaluate the website. Visit the website at: <http://hcergo.org/>. Congratulation to Lynda Enos, the Oregon Coalition of Healthcare Ergonomics and the Oregon State Association of Occupational Health Nurses for creating and supporting this outstanding project.

### **Let's Get Healthy! Visits Local Schools**

Let's Get Healthy! held three fairs for middle school students on November 16-18<sup>th</sup> as part of a 5 year partnership with West Linn/Wilsonville School District. The fairs introduced 1,650 students to research while collecting anonymous data for school and research use. The Oregonian recently covered the event and a full description of the events can be seen here: [http://www.oregonlive.com/west-linn/index.ssf/2010/11/west\\_linnwilsonville\\_ohsu\\_lets\\_get\\_healthy.html](http://www.oregonlive.com/west-linn/index.ssf/2010/11/west_linnwilsonville_ohsu_lets_get_healthy.html)



## CROET/OHSU Science Outreach Project Chosen to Represent National Institutes of Health at Washington D.C. Event

“Let’s Get Healthy!”, a public outreach research project developed at CROET by Dr. Jackie Shannon, as part of



Jackie Shannon on the Washington Mall.

OHSU, was chosen to represent the National Institutes of Health at a USA Science & Engineering Festival in Washington D.C. to show the public how human research is conducted.

The fair was held October 23-24, 2010 at Freedom Plaza, Washington, DC. The National Institutes of Health (NIH) selected OHSU to represent them in the USA Science & Engineering Festival in Washington D.C. as a way to show the public how human research is done. Let’s Get Healthy! was developed to teach the public about their health while at the same time allowing them to take part in the scientific process.



Stephano Cetola talks with people waiting in line to visit the “Let’s Get Healthy” booth.

The interactive exhibit invites attendees to enroll as research participants where they can learn about the quality of their lifestyle, sleep, body composition and other areas of healthy living. Let’s Get Healthy! is partnering with West Virginia University for the event and will also feature travelling exhibits related to nutrition developed in



Visitors at the sleep and lifestyle survey station.

partnership with the Oregon Museum of Science & Industry.

As the title suggests, the focus of the entire exhibit is healthy living. Participants of any age received immediate feedback about the quality of their sleep and lifestyle by completing a computer-based survey. They also had body measurements taken. Each of these health screens was completely voluntary and no



Let’s Get Healthy’s exhibit at Freedom Plaza for the USA Science & Engineering Festival.



OHSU representatives Jackie Shannon, Lisa Mariott, Jon Purnell and Stephano Cetola.

information about individual participants was recorded. This event was Let’s Get Healthy!’s first national event. Other Let’s Get Healthy! events this fall included fairs in Portland,

Hermiston and La Grande.

The Let’s Get Healthy! health fair is supported by two grants from the National Institutes of Health. For more information about Let’s Get Healthy, visit [www.octri.org/letsgethealthy](http://www.octri.org/letsgethealthy).

The USA Science & Engineering Festival (USASEF) was our nation’s first national science festival and featured educational



The team poses with Ben Franklin at the Let’s Get Healthy! booth.

activities from 1,500 organizations with 100,000 expected visitors during the two day event. For more information about USASEF, visit <http://www.usasciencefestival.org/>.

## Safety Researchers Address Hazards for Oregon Crab Fishermen

The Oregon Fatality Assessment and Control Evaluation (OR-FACE) program at CROET, in partnership with the Field Research Group at the University of Washington, have obtained a grant from the Pacific Northwest Agricultural Safety and Health Center (PNASH) to conduct

a safety survey and field test a selection of personal flotation devices with Oregon crab fishermen. The U.S. Coast Guard, the Oregon Dungeness Crab Commission, and researchers at the National Institute for Occupational Safety and Health Alaska field station are also included in the project team.



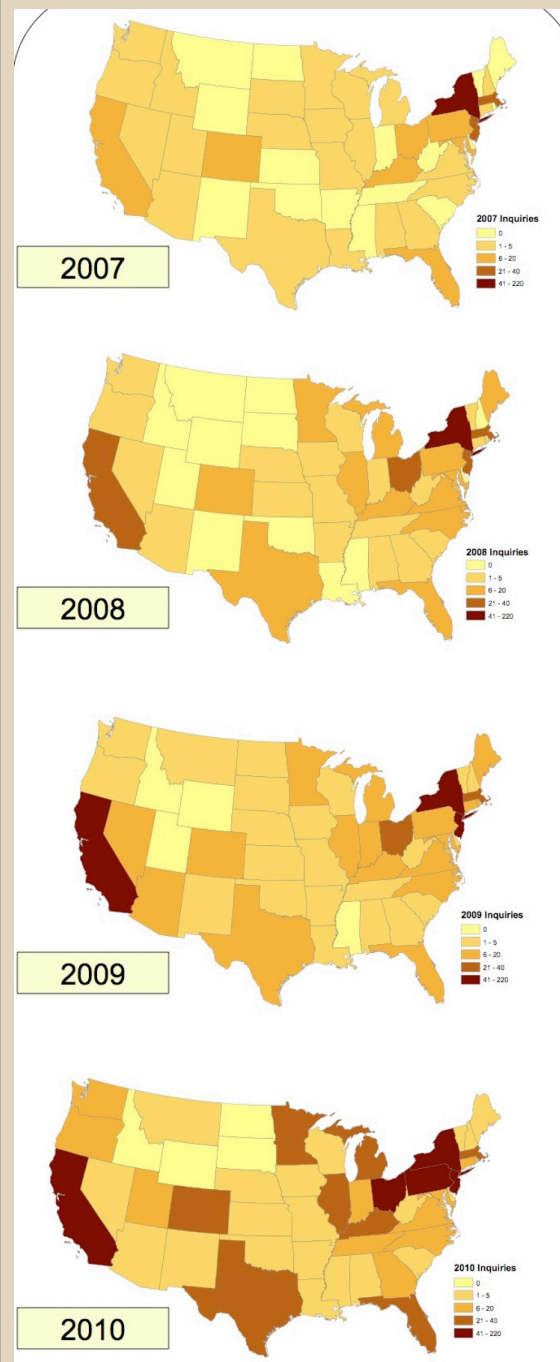
The survey and PFD evaluation come in response to the very high fatality rate among Oregon commercial crab fishermen, and investigates crab fishermen's experiences and views related to critical safety issues. The scope of the project covers the primary crab port at Newport and the most hazardous port at Garibaldi. Together, the safety survey and PFD evaluation mirror a model study conducted earlier in Alaska. Learn more about OR-FACE at, <http://www.ohsu.edu/xd/research/centers-institutes/croet/out-reach/or-face/>

## National Pesticide Information Center Provides Information on Bed Bugs

The old adage, "sleep tight, don't let the bed bugs bite", comes from an era when bed bugs were once very common. We may now be returning to that era. Bed bugs are reemerging as a nuisance in the U.S., as evidenced by an increase in bed bug-related calls recorded by the National Pesticide Information Center (NPIC) at Oregon State University. Experts suspect the resurgence is associated with increased international and domestic travel, lack of knowledge necessary to prevent infestations, increased resistance of bed bugs to pesticides, and ineffective pest control practices.

By nature, bed bugs are stow-a-ways. They enter homes or apartments by hiding out in the cracks and crevices of luggage, furniture, clothing, pillows, boxes and other

objects when they are moved between apartments, homes and hotels. Bed bugs hide during the day and typically feed at night. Since bed bugs feed on blood, their presence has little to do with the cleanliness of the home, although clutter can provide hiding spaces for bed bugs and make them difficult to treat. Bed bugs can survive for months without



Change in bed bug-related calls received by NPIC from 2007 to 2010. Darker shades indicate larger numbers of calls.

feeding, so they may be present in vacant, clean homes when new tenants unpack. Once bed bugs are established, they rapidly reproduce and spread from room to room.

Because bed bugs can be very difficult to control, even for trained professionals, it would be wise to remember another adage: "forewarned is forearmed". In other words, prevention through knowledge may be the best strategy. NPIC has posted a plethora of information about bedbugs on its website, which can be accessed here: <http://npic.orst.edu/pest/bedbug.html>.



## Brochure Focuses Attention on Driver Distraction

The new Oregon Fatality Assessment and Control Evaluation brochure – Dialing, talking, texting ... Know the Hazards of Driver Distraction – is now available online at the OR-FACE website ([www.ohsu.edu/croet/face](http://www.ohsu.edu/croet/face)).



The brochure discusses distractions common to both handheld and hands-free phones, including issues of mental distraction while multi-tasking, and presents a table of relative risk ratios for the most common distractions (with data from the Virginia Tech 100-Car Study). Also included are three stories of fatal incidents in Oregon involving drivers using cell phones, and a list of safety recommendations to prevent such incidents.

The brochure was produced in response to a request from safety trainers at SAIF, the state's principal

Workers' Compensation insurer, and was designed to facilitate printing from the online document. Response by agencies supervising employee car fleets has been enthusiastic. OR-FACE intends to produce a print run of the brochure to circulate through Oregon transportation and driver safety offices, and to other target audiences.

("Alerts" cont. from p. 2)

of links to nasal cancer and leukemia, while NIOSH and the International Agency for Research on Cancer list it as a known human carcinogen.

### Conclusion

As noted in the report issued by Oregon OSHA and CROET, "Keratin-Based Hair Smoothing Products and the Presence of Formaldehyde", it was concluded that there are meaningful risks to salon workers when using these hair-smoothing products. Effective control of those risks depends upon accurate information regarding the potential hazards and the control measures available, which in turn begins with an accurate understanding of the product ingredients and the potential harm they may cause.

Oregon OSHA and the Oregon Health Licensing Agency (OHLA) have advised all Oregon stylists that hair-smoothing treatments – particularly those referred to as "Keratin-based treatments" – should be treated as formalde-

hyde-containing products. Oregon OSHA and OHLA state further that the requirements of the Formaldehyde Standard must be followed when there are employees under the Oregon Safe Employment Act (OSEA). Further, employers are advised that any product that contains "methylene glycol" will be treated as a formaldehyde-containing product.

To access all alerts on this issue, visit <http://www.ohsu.edu/xd/research/centers-institutes/croet/emerging-issues-and-alerts.cfm>

("Healthy!" cont. from p. 3)

### Health Education and Data Collection Work in Tandem

Individuals who participate in Let's Get Healthy! receive an anonymous bar-coded wristband that is scanned at computerized work stations where they find information about health and their personal health status. The identification bracelet makes it easy to collect the information into a database that currently comprises about 100 variables, and a growing list of over 7,000 anonymous participants.

CROET Scientist Jackie Shannon leads the project, together with Associate Director Lisa Marriott, and technical wizard Stephano Cetola, who integrated the ID bracelet, touch-screen computer stations, and the background electronic connections to make it all work. Eight data-gathering stations include the entry point where participants provided information on their age, gender, and race/ethnicity; plus diet, sleep, cancer, body composition, blood chemistry, DNA (collected with mouthwash), and evaluation of attitudes about science and research. Dr. Shannon is particularly interested in results related to nutrition and cancer risk factors.

Other research projects are easily integrated in the design. Five independent researchers, so far, have set up their own exhibits alongside the core program to take advantage of the bar-coded bracelet to coordinate their data collection on specific areas of interest with the larger database.

The Health Discoveries database is currently accessible to researchers by request. The next goal, according to Dr. Marriott, is to organize the database for online access, not only for researchers, but also for continuing education for use in schools and for individual participants to compare their own results (accessed by their barcode number) to other selected groups and recommended health standards. Grant proposals now pending are expected to fund the next phase of development for the database, and a new dose of technical wizardry by Cetola will help bring it online. For more information, contact Dr. Lisa Marriott (503-494-8775 or [marriott@ohsu.edu](mailto:marriott@ohsu.edu)).

# Center for Research on Occupational and Environmental Toxicology

CROET, the Center for Research on Occupational and Environmental Toxicology at Oregon Health & Science University, conducts research, provides consultations and offers information on hazardous chemicals and their health effects. CROET's scientists and research staff explore a range of questions relating to health and the prevention of injury and disease in the workforce of Oregon and beyond. CROET's Toxicology Information Center is open to the public and is staffed to answer Oregonians' questions about hazardous substances in the workplace and elsewhere. CROET's Web site also provides answers to questions about industries found in Oregon through links on a series of pages devoted to industry-specific topics.

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# OUTREACH

## **42nd Annual Northwest Agricultural Show**

Portland Expo Center - January 25-27, 2011

## **Oregon Governor's Occupational Safety & Health Conference**

Oregon Convention Center - Portland, Oregon – March 7-10, 2011

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Join CROET's e-mail list for monthly updates about additions to the CROET web site, news and upcoming events. To subscribe or read past updates, go to <http://www.croetweb.com/newslet.cfm>.

Oregon Health & Science University includes the Schools of Dentistry, Medicine and Nursing; OHSU Hospital; numerous primary care and specialty clinics; multiple research institutes and several outreach and public service units. OHSU is an equal opportunity, affirmative action institution.

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