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PEPH Webinar Summary | April 2012

Examining and Communicating the Health Implications of Arsenic in our Food System

Several recent studies have revealed unexpected sources of exposure to arsenic through consumption of food. PEPH hosted a webinar on April 3, 2012, to highlight the science of the recent findings and discuss the challenges and approaches to communicating an important public health message. The webinar featured presentations by:

Margaret Karagas, Ph.D., director of the formative Children's Environmental Health and Disease Prevention Research Center at Dartmouth and a Project Leader on the Dartmouth Superfund Research Program.

Laurie Reynolds Rardin, research translation coordinator with the Dartmouth Toxic Metals Superfund Research Program.

Margaret Karagas opened the webinar by providing some background information about arsenic research. In experimental systems, arsenic has been shown to have early life health effects; additionally, arsenic crosses the placenta. In the general population, the main exposure routes for arsenic are through drinking water from private wells and rice. Private wells that serve less than 25 individuals or 15 households are not regulated and should be tested for arsenic content. Currently, the US and the EU have no statutory limits for arsenic content in food. Karagas participated in a European Food Safety authority committee a few years ago that conducted an extensive review of food arsenic values and concluded that dietary exposure to arsenic should be reduced.

Karagas has established a pregnancy cohort of women who use a private well at their homes and is measuring multiple biomarkers of arsenic exposure during pregnancy, in their newborns, and over their infants' first year of life. Karagas shared some of the preliminary results of this study that indicated that drinking well water and consuming rice were associated with urinary arsenic concentrations in pregnant women. Additionally, she mentioned another study that is underway led by Kathy Cottingham, a Project Leader on the formative Children's Environmental Health and Disease Prevention Research Center at Dartmouth, investigating infant/ toddler exposure to arsenic through drinking water and rice products. This research is studying several biomarkers for arsenic exposure. The initial results showed high levels in some formulas (especially those with brown rice syrup), which justifies further research. These results suggest that it's important to consider multiple exposure routes when trying to reduce exposures. Karagas closed her presentation by emphasizing the importance of community engagement and careful messaging with relaying nutritional recommendations.

PEPH Webinar Series
The Partnerships for Environmental Public Health (PEPH) Program established the PEPH Webinar series to promote interactions among PEPH grantees and to increase awareness of common issues and approaches. The webinars facilitate consideration of emerging issues. While the primary audience is grantees within the PEPH network, anyone interested in environmental public health is welcome to register.

If you have any questions about this webinar or future webinars please contact Justin Crane (cranej2@niehs.nih.gov, 919-794-4702).

Laurie Reynolds Rardin followed up by giving an overview of the arsenic research at the Dartmouth Toxic Metals Superfund Research Program. With the recent research on arsenic and rice, getting the appropriate risk communication message out to the stakeholders, the media, and the public has been a challenge. To tease out some of the complexities of this task, she provided some background information about risk, which is defined as the likelihood that a harmful consequence will occur as a result of exposure to a hazard. Therefore, for risk to occur, there must be both a source of risk (hazard) and an exposure to the hazard. With food, the potential for the level of exposure varies widely depending on multiple factors and there are benefits of the food item to consider as well as the risk.

The paper led by Brian Jackson – Arsenic, Organic Foods, and Brown Rice Syrup – was released on February 16, 2012, and it received a lot of attention from consumers and the media. This response emphasized the importance of communicating clear messages with emerging science, especially in terms of conveying benefits as well as risks. Rardin explained that public has different communication needs than scientists; they want the bottom line first and then supporting information. With translation of emerging science, it's important to keep the messages clear and simple, time your release, consider the numerical information being presented (e.g., is it going to make sense to the media and public, will they know how to interpret it, etc.), ensure that the team members all communicate the same message, and notify practitioners who may be receiving calls for information. Furthermore, it might be helpful to interview community members or have focus groups to determine what information is most useful, and it's a good idea to have a website available with follow-up/ background information. Rardin closed her presentation by indicating that the FDA released a statement on February 17, 2012, indicating it was studying arsenic in rice and rice products, which means the dialogue on standards for arsenic in food has begun.

The webinar concluded with a question and answer session. Participants asked questions on the following themes.

Information about arsenic concentrations in various foods and the health effects. Karagas indicated the variability of arsenic content in rice. The intent is to inform regulatory agencies and get the arsenic content of food items regulated. This research is not making any dietary recommendations.

Long and short grain rice arsenic concentrations. The Jackson study didn't know what type of rice (long or short grained) was used in the organic brown rice syrup studied. The Karagas study didn't ask what type, what brand, or the country of origin for the rice products consumed initially, but they are collecting that information now.

Cooking water factored into rice arsenic concentration. Karagas said that their analyses assumed there was no arsenic in the cooking water of consumed rice.

Evidence in your research that actually determines the level of dietary arsenic that may present an unreasonable risk to public health. Karagas responded that this is an important question and one that they are addressing in their research right now. The preliminary study discussed in today's webinar found that arsenic is present in certain formulas that had brown rice syrup; the pregnancy cohort results were based on an exposure biomarker study. They are looking at the health consequences downstream of those exposures, but none of the research presented in the webinar today relate arsenic ingestion from rice to a health outcome.

Parental concerns about their children's arsenic intake through products containing organic brown rice syrup. There are different factors for a baby or child as compared to an adult, but the science is still emerging and there are many unknowns. It's important to think about total arsenic exposure, so private well testing is of critical importance.

Arsenic in rice from former agricultural land use rather than naturally occurring from soil. Rardin indicated that they didn't determine if the arsenic in the rice was from naturally occurring sources or from agricultural land use. But, they knew that the arsenical based pesticides for boll weevils used in cotton fields would leave a residue, which would have to be considered as a factor for rice grown there, along with the arsenic naturally occurring in the soil and in the water used to irrigate the fields.