

## Innovative Method Curbs Health Hazard

Scientists at the City of Milwaukee Public Health Laboratories never anticipated that their work would impact the entire nation when they tested a seasoning salt consumed as a candy in the Milwaukee Hispanic community.

The salt had already been implicated as a potential health hazard by media in California when a Milwaukee television station contacted the City of Milwaukee Health Department's Lead Program in 2004. The station had contracted with a private laboratory to have samples from local markets tested at a private laboratory. The results raised concerns: one sample surpassed the lead level set by the FDA, another exceeded California's standard for lead content.

Following on the station's initiative, the Lead Program picked up 13 samples similar to those analyzed at the private lab for initial testing at Milwaukee's lead laboratory. Initial screening identified an elevated level of lead of greater than 0.5 parts per million (ppm) in the salt. Calculation of how much a child could ingest based on average consumption showed that the product constituted a clear health risk.

Federal health regulations mandate zero lead content in food. How then could the salt be widely available to young consumers in the candy aisle of stores? The answer proved to be the definition. The FDA had categorized the salt as a seasoning, not as a candy; low lead content is permissible in seasonings.

Though initial testing had established grounds for concern, the City of Milwaukee Public Health Laboratories could not demonstrate that the salt constituted a threat to local health without a definitive analysis using validated methods specific to that substance. But would the city be willing to underwrite the cost of an initiative that would require the full-time services of the lab's analytical chemist who normally conducted testing for the city's proactive lead abatement and blood lead programs?

Fortunately, the City of Milwaukee Health Department had the political will to address the issue. The laboratory was granted permission to outsource its blood lead work temporarily to allow the supervisor of its chemistry program, Dr. Ben Hui, to devote himself full-time to developing a validated testing method.

Dr. Ben Hui and Dr. Steve Gradus, the lab director began by contacting public health, private and university labs in Wisconsin, California, Minnesota, New York and Chicago plus several FDA labs. Two laboratories—the California state public health lab and the FDA lab in Washington, DC—were already working on a validated method for the substance. Dr. Hui reviewed all available methods and evaluated whether they would work on Milwaukee's equipment using available staff. Ultimately, Dr. Hui opted to develop his own method using elements from methods originated at other labs.

Designing a validation method for detecting low lead level in a high salt content substance presents serious challenges with instrumentation and matrix controls. Dr. Hui labored over the method using a Graphite Furnace Atomic Absorption Spectrophotometry an instrument that can detect lead down to 1 parts per billion (ppb).

After more than two months of intensive work, he arrived at a rapid, highly sensitive method of such high quality that it was unassailable even by chemists at the international candy company that manufactured the salt. Dr. Hui had definitively established that the substance posed a health threat to residents.

This information supported intervention by the city. City health officials fanned out to stores that sold the salt and ordered that the item be removed from the shelves. The department also issued a press release to alert all local vendors.

As a direct result of this and similar efforts across the nation, the candy company pulled the product from the US market several months later. Subsequently the FDA, which had been working on this problem, proposed reduction of the lead limit in seasonings from 0.5 ppm to 0.1 ppm.

Dr. Hui presented his method in March 2006 at the Pittsburgh Conference of Analytical Chemistry and Applied Spectroscopy, the major international meeting in laboratory science. To review the abstract of his presentation, see <http://tinyurl.com/eevem>.

For more information on the method and other accomplishments of the Milwaukee Public Health Laboratory, please contact the director Dr. Steve Gradus or Dr. Ben Hui at 414.286.3526, [sgradu@milwaukee.gov](mailto:sgradu@milwaukee.gov) or [bhui@milwaukee.gov](mailto:bhui@milwaukee.gov).



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