

BEFORE KAN SHAO JOINED THE FACULTY OF THE IU SCHOOL OF PUBLIC HEALTH-BLOOMINGTON, HE WAS PART OF A TEAM AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY WORKING ON MODELING METHODS AND TOOLS FOR ASSESSING HUMAN HEALTH RISKS.

AT THE CHINA GATEWAY:

RICE, ARSENIC, AND THE TOOLS OF RISK ASSESSMENT

Now an assistant professor in the Department of Environmental and Occupational Health, Shao received an IU President's International Research Award to study environmental policy making in general and the risk of arsenic in rice specifically. His practical and theoretical experience formed the basis of a sold-out workshop at the China Gateway on "Human Health Risk Assessment Training." Professionals and graduate students from all over China with diverse occupational backgrounds

came to Beijing to learn how to use the risk assessment framework and tools developed at the EPA and to explore how those methodologies can assist in the development of regulations to support food and environmental safety.

A notorious scandal involving contaminated milk powder for babies in China a decade ago led to government action. "In 2009, the Chinese government passed a law stressing the food safety issue, and they developed a food safety risk assessment center," Shao said.



Assistant Professor Kan Shao brought practical and theoretical experience in establishing environmental policy to colleagues in China.

Many of the issues that China faced are similar to those in the U.S., and the methods developed by the EPA could be applied productively in China. Consequently, many more were interested in the workshop than the space could accommodate.

Food risks are not always caused by human action. In the past two decades, the presence of arsenic in rice has raised concerns. "Arsenic occurs naturally. It's in the soil, it's in the water, it's everywhere," Shao said. "Rice is especially good at accumulating arsenic from the water and soil, more so than wheat or corn. In the U.S., the consumption rate of rice is quite low compared to China, where it is almost the most important staple food. All kinds of rice have arsenic issues. Eating rice is not a problem for most in the U.S., according to a recent risk assessment report by the Food and Drug Administration, because the consumption rate is low. However, if the U.S. population eats as much rice as Chinese people, based on the



A capacity crowd came to the China Gateway for an opportunity to become familiar with EPA assessment methods for health and environmental safety.

rice in the U.S. market, that's a problem. I have a Chinese diet palate. I eat rice twice a day and so risk developing adverse effects like lung cancer and bladder cancer."

Before the framework developed by the EPA can help determine safe levels of arsenic in rice, researchers need to collect data—consumption of rice in the population and concentration of arsenic in rice samples from the Chinese market. Shao's research partners at Peking University and the Zhejiang Academy

of Agricultural Sciences are working on that.

The primary aim of the three-day workshop was to introduce the risk assessment framework and to train participants in using it to analyze data in the early stages of risk assessment. "I taught participants how to use the EPA benchmark-dose software for dose-response modeling," Shao said. "That's the real, get-your-hands-dirty part. Applying the techniques developed at the EPA, they can use data from toxicological studies to estimate health

under various exposure scenarios. These are the key components of a quantitative risk assessment."

In order to minimize expenses for participants, Shao reduced the workshop from the originally planned five days to three. Space limitations could accommodate only 30 students. In 2018, Shao is considering two workshops, a repeat event in Beijing and an additional workshop in Hangzhou. He would also like longer sessions. "I could actually use more than three days in order to talk about

the theoretical issues and to use more than one case study."

Shao expects strong continuing interest in this work. "One student, who had attended a similar 15-day workshop in the U.S., said she felt she had learned much more in the three days of the IU workshop. The earlier workshop covered a lot that was not relevant to her work, but at the IU workshop, she learned techniques that she can use in her job." ■